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TYPES OF TEACHING

BY

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WITH AN INTRODUCTION
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HOUGHTON MIFFLIN COMPANY
BOSTON NEW YORK CHICAGO
The Riverside Press Cambridge

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To

PROFESSOR AND MRS. FRANK M. MCMURRY

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PREFACE

Some experiments conducted by the writer a few years ago gave evidence that teachers were not clear in their own minds as to what they desired their pupils to do when they studied their lessons. There were strong indications that they wanted the contents of textbooks memorized. Aside from memorizing, there was little suggested that was definite. This lack of knowledge of the true nature of study indicates a lack of knowledge of the nature of subject-matter, of the purposes it serves, and also of the various forms of teaching through which the ends of education are accomplished. Experience both with teachers in training and with teachers in their own classrooms confirms the idea that many are limited in their understanding of subject-matter and in their use of method.

From the writer's close relation with the school-room has grown the attempt to remedy the situation just described. Both exposition and illustration have been employed. The many examples cited have been taken from actual lessons, hence they show what can be done. They are not free from error and weakness, and this fact should encourage those who seek to improve their own procedure. Perfection in the model studied arouses suspicion that it is not true to life and cannot be realized in actual practice.

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It is perhaps not too strong a statement to say that the prevailing fault with teachers is that they go before their classes, day after day, without having definite aims in mind, and without having determined how they will teach the lessons. They have not decided whether they are to increase knowledge, to form habits, to influence feelings, or to establish some new relations among ideas already known. The chapters here presented are intended to remedy this situation, and to help teachers decide definitely what the nature of each lesson is to be.

The subject of lesson plans has been treated from two viewpoints. There is the complete plan for those who are in training, or for the teacher who wishes to work out an entire unit of subject-matter. There is also the condensed plan for those who must cover several lessons every day, and who cannot possibly amplify the plan for each recitation period. Teachers must learn to do in planning what they expect their pupils to do in studying, — see the main points and keep them in mind.

The author's indebtedness to Professor John Dewey for his conception of education will be apparent to the reader. It is freely acknowledged. The services of the many who have contributed lesson plans, or who have taught the lessons which have been reported, are recognized with gratitude. To Professor F. M. McMurry thanks are due for suggestive criticism. Grateful appreciation is hereby rendered to Professor Henry Suzzallo,

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whose counsel helped to determine the character of the book. He must share largely the responsibility for the fact that it was written at all.

LIDA B. EARHART.

NEW YORK,
October 26, 1914.

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INTRODUCTION

A NEW volume on the art of teaching is here presented. It is offered to the professional public in the belief that its discussion of the theory of proper classroom procedure will be more helpful to the average practitioner than the works hitherto available. Large as have been the contributions of the pedagogical texts published within the last decade, the perpetual need of a simpler and more practical statement remains. There is, too, the necessity for incorporating in book form such new facts as have been revealed by the numerous inquiries and experiments of the last few years. The present volume is, therefore, a reinterpretation of teaching procedure, stated, as far as possible, in the current and familiar phraseology of ordinary teachers, yet taking into account the recent investigations of our ablest educational thinkers. It offers a combination of scholarship and practicality rarely found in teachers' texts.

The teachers of the primary school will be quick to appreciate the worth of the pedagogical principles here elucidated. Their experience with progressive practice is now ample enough to make them sense fully the importance of generalizations which take modern experimentation into account. They will welcome a

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systematic summary which clarifies many obscure points, resolves long-debated issues, and shows the practical bearing of abstract laws.

Teachers in secondary schools will find in this treatise much that is novel. They have so recently turned from traditional practice to scientific theory that they will find more that is suggestive in this volume than their colleagues from the lower schools. In spite of the fact that teaching difficulties have been multiplying with such great rapidity as to make help welcome from any direction, the high-school instructor has been repelled by current texts because these have been written almost exclusively from the point of view of elementary school practice. He will be glad to read a book which meets him halfway.

There was a time, not long since, when the institution of teaching method was scantily accepted even among elementary school teachers. Now that recognition is won there, the battleground shifts to the teachers of our secondary schools. It may be said that we are just at the beginning of the movement to prove the worth of modern pedagogical procedure to the higher schools. An inquiry into the misconceptions which must be fought will do much to indicate the difficulties of that campaign.

An initial misconception which will be encountered is the belief of many teachers that "there is nothing in teaching method; that one has only to know his subject thoroughly to teach it well." This is a view widely

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held by instructors in high schools, more particularly those trained in the universities. It is very largely the reflection of the attitude of their college teachers.

To give the origin of such a prejudice is to offer the best criticism of it. The university instructor does not appreciate the importance of teaching methods merely because his greatest difficulties do not lie in this particular direction. The students that he teaches are not far removed from the maturity of his own mind. The gap to be bridged is slight. His own scientific organization of thought almost suffices to reach them. At least his partial failure with a traditional college clientèle is not dramatic enough to attract his attention. But he is very much concerned with advancing the margins of knowledge and with acquiring the latest known truth. Here he finds his major problem. His chief difficulty is to equip himself with content. Hence with him, scholarship is everything and teaching process nothing at all. His prejudice against any large emphasis upon modes of presenting knowledge is merely an expression of his accidental state of mind. It is a naïve generalization from his personal situation.

The case is quite the contrary among primary teachers. They were the first to recognize and develop a theory of teaching method. The facts and skills with which a teacher of little children is concerned are so elementary as to be a common possession among adults. Scholarship is not a problem, but its presenta-

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tion is. The distance between the teacher's sober and abstract mind and the playful, active, and concrete interests of boys and girls is great. The chief problem is to bridge the gap. Thus artfulness in teaching becomes the major task. Hence the readiness of primary teachers to believe in the magical properties of method and device. They, too, are merely expressing their own accidental attitude of mind, judging naïvely from a special case.

The secondary teacher's midway position between the college and the primary school creates his dilemma. By situation, scholarship is to him more than to the elementary teacher, and teaching methods more than to the college professor. Tradition and training have allied him with university men; and in the past he has shared their points of view. But the increasing horde of unselected youth that comes to him from the elementary school now creates difficulties which make him more and more sympathetic with the elementary school's methods of adjustment. Relaxing his traditional over-confidence in mere scholarly attainment and developing a new tolerance for the mental life of youth, he turns hopefully toward the promises of pedagogical theory. Perhaps when a decade or more has passed and his mind has assimilated the new technique of modern teaching, he will reveal, better than the teachers above or below him, that true synthesis of scholarship and teaching method which every teacher should bear in mind.

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But teachers, whatever their location in the educational system, have been prone to rely on too narrow a range of teaching methods. If they but saw that each teaching method has only a relative worth, they would be more versatile. A method of teaching is only a means to an end. Modify the purpose or the condition of operation, and the procedure should change. Yet teachers have shown little capacity for remembering this fact. Traditional methods, born of the need to teach a dead language, have been transferred bodily to the teaching of a live mode of speech. What has been used in spelling has been copied in geography. Drill, with a proper sanction in one place, is indiscriminately applied. Objectification, of supreme value with beginners in any domain, is prolonged to the point where it interferes with effective thought. We need to know that every method is a specialized instrument, and just because it has one great strength carries many incompetencies. It must be used in place, for its own particular condition and end. In the whole range of school activities it must be supplemented by many other special means. *There is no one best method for school teachers.* Each procedure is best for a specific purpose or condition, and many are required to meet all the variations in school life. Hence the advent of a better teaching technique will be hastened if we admit, at the outset, that all special means of teaching have only a particular worth; that the teacher must be versatile in the use of methods; and that the best that

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theory can do is to suggest the spirit and the law of the teaching adjustment and to describe those types of teaching which in real practice are found only in infinite variation.

HENRY SUZZALLO.

TEACHERS COLLEGE,
COLUMBIA UNIVERSITY,
December, 1914.

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TYPES OF TEACHING

I

SUBJECT-MATTER: ITS NATURE, DEVELOPMENT, AND PURPOSES

Need of understanding what subject-matter is

THE expression "subject-matter" is frequently associated with that body of knowledge which is to be taught from books only. The method of teaching it often consists of having the contents of books read or memorized with but little consideration given to their meaning or worth. Since an understanding of what subject-matter is, and a clear view of the purposes it serves, have a strong influence upon the methods employed in teaching it, it may be worth while to begin our discussion of methods with a review of that to which the method is to be applied.

Where subject-matter first exists

In the first place, subject-matter always exists in some form outside of books before it is committed to book form. This has been true of the past, and it holds true of the present time. Through accident or design, through the exigencies of life or by reflective thought, new ideas, new ways of acting and of doing things, have

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come into existence. The books on primitive life which have been published within recent years have put before us in greatly condensed periods the progress of man from stage to stage of his material and intellectual development. Tormented by hunger, he learned how to capture and kill the wild animals, how to till the soil and care for his crops. The presence of foes compelled him to devise means of protection for himself and of destruction for them. New forms of danger necessitated the invention of new modes of self-protection. A recent magazine article by a well-known writer [1] shows us this thought clearly. In the Place of Departed Spirits, one who had preyed upon his fellows with teeth and hands cried aloud for judgment upon the man who had killed him by throwing stones. The thrower of stones pleaded the necessity of devising this means of self-defense, and in turn denounced the man who, by means of bow and arrow, had rendered stone-throwing futile. The archer, in turn, urged his need of protecting himself from the stone-thrower, and denounced the use of armor and battle-axes which had made his mode of warfare of no avail. The man in armor complained of the invention of gunpowder; and so the story proceeds, showing how stern necessity had compelled people to think and to act and to advance in proficiency.

One tries vainly to imagine how the discovery was

[1] Kipling, "The Benefactors," in *The American Magazine*, vol. 74, p. 258.

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made that vegetable and animal fibers can be twisted into threads, nor do we know how or by whom the first spindle was invented. From twisting with the fingers to twisting with a cleft stick weighted with clay was a long step. From the cleft stick to the metal spindle was another stage of progress. From the spindle to the spinning wheel was a tremendous advance; and the invention of the spinning jenny is so great an accomplishment that the simple spindle seems utterly insignificant; yet both are responses to a fundamental need of man, — the need of clothing.

Many forms of thought and action

As man's needs were many, his activities leading to their satisfaction were many. He constantly devised and invented processes, tools, weapons, means of communication, of transportation, of recreation, of amusement, of religious worship, and the like. His reflections as to his own origin and the source of all that he saw about him, his relation to the Supreme Being, his duty to his fellow men, led him to a simple philosophy. Barter led to a means of computing. With increasing population came specialization of labor and the growth of manufacturing, as well as a host of other activities suited to the new conditions.

Need of transmitting modes of activity

But once having been attained, these thought products and these various modes of activity had to be

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communicated to others, especially to the young of the race, in order that these might profit by them and might in turn participate helpfully in the affairs of the family, tribe, or nation.

What subject-matter was originally

These various ways of doing things and of thinking about things which were passed on from the older members of society to the younger constituted the subject-matter of instruction. Thus the shaping of arrowheads, the manner of snaring wild game, of catching fish, of making clothing, of building shelters, of tracking enemies, — these and many other processes, in addition to a certain fund of knowledge, traditions, and superstitions, which had accumulated from remotest times, made up the body of subject-matter imparted to the rising generation. By means of it, the young of the tribe were taught how to preserve life, how to destroy the foe; were taught what feelings they should have toward the tribal enemies, what their duties to their own social unit were, what the explanations of natural phenomena were, how they should regard the Great Power which manifested itself in the world about them, and how they should worship it.

It was life with its processes, its arts, and its industries; life with its freight of cultivated beliefs, feelings, and ideas, which was handed down as a precious heritage from one generation to another.

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The integral nature of subject-matter

This heritage, thus transmitted, was a closely interwoven whole, not a mass of distinct, disconnected parts. Subject-matter was a unit and was not divided into separate subjects such as are to-day listed in all courses of study. This was doubtless due to the fact that the teaching was done in connection with the everyday life of the young people and was not conducted in a separate place, at a special time, and by people who devoted themselves exclusively to the art of teaching. It was taught while in the very process of serving its *intrinsic* or *direct function*,[1] which is the function which it serves in the world of life aside from the scholastic world of classes, books, and schoolrooms.

Effect of books upon subject-matter

Nor was the matter to be taught cooped up in books as is now so generally the case. It is conceivable that the introduction of books tended to set apart that which was taught from its direct association with life and its processes, to render it fixed and less susceptible to change, and ultimately to result in a body of knowledge more or less isolated from the world of active life and regarded by some as being more valuable on that account.

Subject-matter modifiable

Subject-matter in its original place, in the world outside of schools and books, is subject to modifica-

[1] W. W. Charters, *Methods of Teaching*, chap. III.

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tion. The conditions which called it into existence may pass; hence the need of employing certain knowledge or processes may pass; and, as far as social usage is concerned, certain units of subject-matter have thus ceased to exist. A textbook in arithmetic, published in the early days of our national life, required the pupils to find the value in Maryland money of a certain sum of Massachusetts money. With uniform coinage, such problems are useless. With modern banking conditions, sight drafts of a kind once employed are no longer necessary; and with business transacted through stock companies, partnership with the time element becomes obsolete. A military academy which spent much of its time teaching the modes of warfare employed even a few hundred years ago would be considered a poor agency to prepare men for the national defense. A consideration of other forms of activity will reveal similar changes due to altered conditions.

Not only is it true that some forms of subject-matter fall into disuse because they are no longer necessitated by conditions; it is also true that they are changed and improved by the genius of man. Chemistry is very different from the alchemy which preceded it, and astronomy is a great advance upon astrology. Long division and the use of the decimal system are not such ancient history but that we may see how superior they are to the methods which antedated them. Even a little reflection upon the arts and industries of

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modern life will convince one that they have been greatly altered from their original form by man's intellectual activity; and while some may question whether all have been improved, there can be no doubt that in most cases, at least, the change has been for the better.

The development of new subject-matter

We have seen that certain modes of activity and certain beliefs have been quite outgrown, and that others have been modified, improved, and made to suit changing conditions. In addition to these variations, new ideas and new forms of activity have come into being, or are at the present time in the process of becoming. The whole science of aeronautics is still in the formative stage. Chemistry extends its bounds from year to year. Electrical engineers present new accomplishments constantly. Philosophy takes now this turn and now that, and refuses to remain fixed. The fields of sociology and economics are just fairly opening up, and the next few years will doubtless see great development in them. The use of the turbine engine has already greatly affected transportation, and the possibilities of the monorail car with its gyroscope are not fully developed. The wireless telephone and telegraph are still so recent as to be ranked with the marvelous. In short, it is difficult to think of any field of human thought or action which is not changing in one or more of the three ways above described. Either some part becomes obsolete and is

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discontinued, or some part is adapted to altered needs and conditions, or entirely new elements are added from time to time as human thought faces and overcomes new situations, or sees the possibility of meeting old ones in new ways.

The subject-matter of the schools and changing social conditions

Are the modifications which society works out reflected in the material taught in the schools? Is the intrinsic, or direct, function of subject-matter the dominant one? In the first place, have all the obsolete processes been discontinued? An examination of the books used by pupils would reveal the presence of some material and some processes which are either quite behind the times, or which are employed by so few people that it can hardly be considered the function of schools meant for all the people to impart them. We still persist with the extraction of cube and square roots; with cases in bank discount which involve finding the time or the rate of discount; and with tables of denominate numbers which are employed by a limited class who, after their public school course is ended, must make special preparation for their careers. The schools continue to insist upon certain uses of the marks of punctuation which business people no longer follow.[1]

[1] See *The Teachers College Record*, vol. IV, No. 2, for further suggestions in regard to subject-matter which no longer has intrinsic value.

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Frequently the schools are slow in introducing the changes which are an established part of social usage. We might expect some lagging behind until the new processes have been found adequate and worthy, but even after proof of worth and usefulness has been established, the schools still fail to introduce the newer forms. Business employs interest tables, typewriters, counting-machines, and other devices for saving time and securing accuracy. How many schools teach their use, or see to it that their pupils know that such devices exist? How many plasterers, paperhangers, and carpenters make their calculations as do the pupils in our schools? What age of literary production is represented by the readers and supplementary material furnished to the pupils, in our elementary schools especially? People outside of school are much interested at present in getting acquainted with the world's best music through the mechanical devices which make this possible. How many schools are still content to do nothing in music except to teach note-reading and such songs as the pupils themselves can render? How many are affected either in material or method by the present great musical movement? There was a time when young people went to work at some business or trade in which they secured their technical training during a period of apprenticeship. Society demands a different plan, in these later days, and the educational world is attempting to respond. The schools must prepare for the occupations at the pres-

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ent time, and they are much engrossed in trying to catch up with the social requirement.

One result of this technical teaching in the schools will be to bring the schools back again into that close contact with life which has for some time been lacking. The highly technical schools have kept this contact, and instead of falling behind in subject-matter, they have forged ahead of social usage and have given the world most valuable assistance. It is only necessary to refer to the magnificent work of our schools of agriculture to justify this statement.

Why the intrinsic function of subject-matter is not made more prominent in the schools.

(*a*) One reason why the schools are somewhat behind the times in the processes and ideas which they teach has already been stated. It is because the schools lead an existence isolated to a certain extent from participation in the affairs of everyday life. The teacher's calling demands much time and energy, and comparatively few people combat the inertia which tends to keep things constantly in the same state. A teacher needs extended and varied experience, keen insight, and almost endless patience in order to keep pace with social advance and to keep her classes in touch with it, to say nothing of bringing them into intimate relation with existing conditions.

(*b*) Another reason for the slowness with which changes in subject-matter are made, or for the lack

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of change, is the idea which prevails with many people that the subject-matter in itself is not of great moment. Its value lies in the effect produced upon the mind of the learners in the process of mastering it. They believe in the doctrine of *discipline;* consequently, subject-matter which at one time had a vital relation with the world's affairs is retained because of the value it possesses as a means of mental training. Many people urge the retention of obsolete processes in arithmetic because they afford excellent training in reasoning. The study of higher mathematics and of the classical languages has been strongly advocated for similar reasons. These subjects are represented as being peculiarly valuable for the mental training which they provide. In the elementary school, the finer intricacies of grammar have been insisted upon for the same reason. History and geography have been presented by many teachers, not so much that they might throw light upon the life of man, but in order that the imagination and the reasoning processes might be trained through them.

There is no need of presenting obsolete material or processes, or situations and problems quite contrary to fact, or such as rarely occur, in order to cultivate the powers of reasoning, imagination, attention, perseverance, and other qualities of the mind. All these can be more effectively cultivated, and the learner at the same time can be brought into close touch with the life of to-day, by using material which is related

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to the environment of the school, to the lives and interests of the pupils and their families, and to the social interests and problems of the present time.

It is well to remember, moreover, that a quality of the mind should be given exercise in as many different directions as possible and upon many occasions, if we wish it to become general in its activity. Reasoning, memory, politeness, truthfulness, and other desirable traits should be cultivated under many kinds of circumstances, and exercised frequently, in order to extend their range, and to increase the certainty of their use when needed.[1]

(*c*) Another reason for the static courses of study in the elementary and high schools is that they are dominated to some extent by the idea that the elementary school must prepare for courses to be given in the high school, and that the high school must prepare for college. In consequence, much of the subject-matter is taught, not because it has intrinsic or direct value, but because it is preparatory in function. The Germans sometimes describe the study of Latin in their *Gymnasia* by pupils during the period between nine and fourteen years of age as resembling a trip through a tunnel. It leads somewhere, but the learner cannot see where. This description is true of other subjects than beginning Latin. They seem to the pupils to contain little value in themselves, the argu-

[1] William James, *Talks to Teachers*, chap. XII; E. L. Thorndike, *Principles of Teaching*, chap. XV.

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ment urged being that they are necessary to the mastery of subjects to be presented later. Their value is thus *preparatory* rather than intrinsic.

At the present time there is much discontent and agitation over the situation which requires so many pupils to spend time upon studies whose chief claim is that they prepare for higher schools, when so few of these pupils attend these higher schools. The effect of this movement will probably cause a radical change in the curricula of the lower schools. The preparatory subjects which are retained will no doubt be made to yield whatever value they possess that is intrinsic in nature.

The pleasure element in subject-matter

Several forms of subject-matter, possessing one or more of the functions already described, may, upon occasion, take on still another purpose. They may be regarded as accomplishments, and may be imparted to pupils not because they are in themselves useful, or disciplinary, or preparatory to other courses, but because they are ornamental in nature. Deportment, music, dancing, art, modern languages, and similar subjects, presented in so-called finishing schools, possess this function. It is proper for people of certain rank or station in life to possess some knowledge of them. They adorn life; they add to social enjoyment; hence they are taught. They are not to be esteemed lightly because of the function they serve, since

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pleasure is an end of education. On the contrary, it might be advisable to make more provision in our schools for those subjects which further the higher enjoyments of society, because it is natural for people to seek pleasure of some kind, and tastes in this direction can be influenced and largely determined by training. The schools have here a duty which they possibly have not realized, and which they certainly have not fully performed.

Summary. (1) Subject-matter represents ways of thinking, feeling, or doing evolved by the race in the course of its development. (2) Subject-matter is modifiable. It may become obsolete because the necessity for its use has ceased to exist, or because a more adequate way of thinking, feeling, or acting has been evolved. Part of a certain form of subject-matter may be changed to suit changing conditions. New forms or units of subject-matter may come into existence. (3) Subject-matter is more likely to experience these changes in actual social experience than in the schools because the life of the schools is to a certain extent set apart from the conditions which modify or produce subject-matter. (4) Subject-matter serves various purposes or functions. Its function may be (*a*) intrinsic; (*b*) disciplinary; (*c*) preparatory; (*d*) decorative.

REFERENCES: John Dewey, *School and Society. The child and the curriculum;* W. W. Charters, *Methods of Teaching,* chapters II–VI, inclusive.

EXERCISES

1. Give examples of subject-matter in five different subjects of the school curriculum which existed before it was put into a textbook.
2. Make a list of ten situations or needs which compelled the making of subject-matter.

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3. Name several ways by which subject-matter is passed on from one generation to another.
4. What are some of the needs of the present time for which subject-matter has not yet been provided?
5. What objection have you to offer to the definition of subject-matter as a way of doing something or thinking about something?
6. Give at least one good argument for, and one against, the use of books as a means of imparting subject-matter.
7. What changing social conditions can you mention for which the schools do not as yet provide?
8. What can the schools do in practical ways to teach the intrinsic function of subject-matter?
9. Mention three subjects which are taught because they prepare the way for later subjects. Have these subjects any intrinsic value?
10. What subject-matter did you ever study or teach because it was supposed to result in mental discipline? Should you say that it accomplished this result? If you think it did, do you regard it as more effective for the purpose than subject-matter which has a place in actual practice outside of school?
11. Do you object to teaching subjects because they give pleasure or are classed as accomplishments? Mention several subjects of this nature. What argument can be urged in favor of providing for them in the course of study?

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II

WHERE EDUCATION MUST BEGIN

Ideas more or less complete and more or less organized

WHEN children enter school, they are not only young in years, but they are also young in thought, in activity, in life in general. It is true that they have acquired a large store of ideas, but many of these are incorrect or incomplete. Very little organization, comparatively speaking, has as yet taken place among the different mental states, and even that little is often found to be faulty. Of actual experience, accumulated by themselves, there is only a small store. They have had glimpses of only a few pages of the world's great volume, and have not fully comprehended those few.

We never arrive at a stage where our ideas are complete and free from error and where we have established all the necessary, to say nothing of all the possible, relations among them. We always lack some knowledge; we always know some things incorrectly; we constantly fail to see the traditional four that comes from putting two and two together; that is, we do not always see the significance of things because we fail to relate them to ideas which would explain them.

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The younger we are and the less trained we are, the greater the extent to which these statements are true. In very young school children, we should expect to find them especially applicable.

Attitudes and feelings

After very early infancy, we have, at any stage of life, a varied assortment of feelings about people and things. Certain experiences please us and we seek to repeat them. Others annoy us or cause actual discomfort, consequently we try to avoid them. We like some people and dislike others. We like certain colors, fabrics, kinds of music, more than others. We prefer reading to outdoor games, or the reverse. We are selfish or generous, kind or cruel. We are either broad-minded or harsh in our judgments of others. Sometimes we older people overlook the fact that children, even at an early age, have these traits developed to a considerable degree, and that they are factors to be taken into consideration in teaching and training pupils of any age.

Probably many of our mental states are accompanied by so little feeling of any kind as to be almost colorless. But many of them are so strongly tinctured with feeling that subsequent thought and actions are decidedly influenced. Sometimes a certain kind of feeling becomes so firmly associated with an idea as to be recalled to the mind whenever the latter reappears. In such a case we have an attitude of mind, a

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prejudice, a sentiment, fixed likes or dislikes, and conduct is governed accordingly.

Surely these habitual states of feeling, whether mild or extreme, which have become associated with ideas, should receive attention from the teacher. It has been the disregard of them which has led, at times, to difficulty in dealing with undeveloped or backward races, or with nations having ideas and sentiments peculiar to themselves. The emotions, the prejudices, the mental attitudes of these people have often been overlooked in the attempt to govern and educate them, and serious difficulties have resulted. Thus the Sepoys of India, who eat no animal food, resented using tallow-coated cartridges; and the Chinese, who worship their ancestors, felt outraged when foreigners constructed railroads through their cemeteries. Doubtless we work at cross-purposes in dealing with young people, and waste both time and energy, because we disregard the likes and dislikes, the enthusiasms and prejudices which they have accumulated.

Native endowment of instincts and capacities

In addition to the store of knowledge and the somewhat settled feelings which young people possess, we have to take into consideration the social experience which persists in them in the form of instincts and capacities. By an instinct we mean an inherited or unlearned tendency to behavior or action. It is instinctive for us to be active, both physically and mentally; to

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imitate other people; to feel jealous, to become angry; to feel curiosity; to wish to do as well, if not better, than others have done.

According to the purposes which they serve, instincts have been classified as (*a*) individual, such as fear and fighting; (*b*) social, such as emulation, rivalry, gregariousness, shame, sympathy, mothering; (*c*) adaptive, such as imitation, play, curiosity, attention, interest. Other instincts are the collecting instinct, the instinct to manipulate, whether to construct or to destroy; the instinct to express one's ideas in some way; and the æsthetic instincts, which show themselves in personal adornment, in a liking for colors, for harmonious sounds and rhythm, and in the tendency to apply decoration to objects. Both mental and physical activity are instinctive.

Not all of the instincts are present at birth. Many of them develop in childhood, while others appear during adolescence or even in a later period of life. Some of these delayed tendencies are the instincts to emulate others, to master people or things, to make collections of various kinds, to show off, to exercise intellectual curiosity.

Since it is upon the instinctive tendencies to action that education must build, it is important that teachers know at least those instincts which are most helpful in education at the stage of development at which their pupils stand; otherwise they may attempt to employ instincts not yet active, or which have served their purpose and have ebbed away.

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Acquired modes of acting; habits fixed or in the process of formation

In addition to the native or unlearned tendencies to action, the pupils who present themselves in our classes for instruction possess a large store of acquired ways of acting or of responding to situations which confront them from day to day. These acquired modes of behavior are called habits. Rowe has defined a habit as being an acquired aptitude for some particular mode of automatic action. Under the term he includes habits of decision, of feeling, or of thought. In a later chapter we shall consider the teaching exercises which bear directly upon the influencing of habits. At this point we simply recognize that habits of acting, ways of thinking about things, and feelings which have become fixed or customary are a large part of the equipment of the learners in any class. They either help or hinder the teacher in carrying out the general aims of education and are of much more importance than is generally recognized.

The teacher who undertakes to conduct a lesson in expressive reading, in penmanship, in cooking, sewing, manual training, or in almost any subject, must take thought in regard to the habits of speech or action or skill of his pupils in order to accomplish the best results in the lesson exercise. He may either have to overcome bad habits previously formed or to carry new habits forward toward the stage of automatism.

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Summary. The equipment of any class which forms the basis upon which education must build consists of (1) a body of ideas only partially complete and knit together into an organization; (2) an accompaniment of feelings, attitudes, likes, and prejudices which color knowledge and influence action; (3) a native endowment of tendencies known as instincts; and (4) of a large body of acquired modes of acting, whether these actions be mental or physical, which we call habits. These habits have had their origin in the instinctive tendencies or instincts.

REFERENCES: E. A. Kirkpatrick, *Fundamentals of Child Study*, chap. IV; Stuart H. Rowe, *Habit Formation and the Science of Teaching*, chap. IV; E. L. Thorndike, *Elements of Psychology*, chap. XII.

EXERCISES

1. Make a list of ten incorrect ideas which school children have been found to possess. Of ten incomplete ideas. Of five incorrect classifications or associations.
2. Give examples of mistakes you have discovered in your own ideas within the past year. Was the mistake due to an incorrect idea, an incomplete idea, or to a wrong classification?
3. Show how lessons in nature study and art may have to take into consideration the likes or the dislikes of pupils.
4. What are some of the attitudes of mind of pupils which should be utilized in teaching history and geography?
5. What subjects are sometimes hard to teach because of the unfavorable frame of mind of the learners? What can be done to help the situation?
6. What distinction do you make between instincts and capacities? Verify your answer.
7. Show how teaching must consider the native endowment of pupils in order to be successful.
8. Give two illustrations of the use of an individual instinct, of a social instinct, and of an adaptive instinct in education.
9. Explain what is meant by delayed instincts. What significance for teaching exists in the fact that some instincts are delayed?
10. What was wrong with the ideas of the child who defined a frog as "a four-legged, bow-legged bird that walks before and sits behind and has no tail almost"?

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III

WHAT SCHOOL EDUCATION SHOULD ACCOMPLISH

Education should remake and extend experience

EDUCATION at any stage of its progress must be based upon the experience of the person educated, — that is, of the learner. Indeed, the aim of education, as stated by one of our best-known educators, is the remaking of experience. What experience is we have considered in the previous chapter. Stated broadly, at any stage of one's development, one's experience consists of his store of ideas with the meanings he has attached to them and the associations he has formed among them; of his ways of feeling about things or of looking at them, — that is, of his emotional states, his interests, his prejudices which have become more or less fixed; of his instincts; and finally, of his habits of conduct, skill, and activity in general. Experience is a complex thing, made up of various elements, constantly changing, constantly undergoing revision, correction, extension, constantly influenced by its past, and ever forming the basis for the next step in advance. It is only through extending it in some direction, or through correcting errors which have crept into it, or through making new associations among its elements, that education takes place. This process of

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extending or correcting, and of forming new associations, constitutes the remaking of experience which is education. One has only to apply this thought to any school subject to see its significance.

In beginning geography the few ideas which children have about land and water, climate and soil, people and their activities, are employed as the starting-point in the remaking process. Errors are corrected, ideas are enlarged, new knowledge is added to old from grade to grade, until the children finally complete the course outlined in the subject. They may continue in high school in special courses in commercial or physical geography, but in these subjects advancement is possible only by means of remaking the geographical experience previously acquired.

In teaching mathematics the knowledge, however slight, which children have of number has to be used as the beginning of education in that direction. Their mistakes are corrected, new combinations are learned, new applications are employed, and experience is widened and deepened as the pupil advances in his course. Whenever the instructor attempts to take up ideas for which the pupils' past has not prepared them, there is a break in the process of education. There can be no remaking of experience, since the basis is lacking. In teaching any subject a basis in experience is indispensable. Education consists in remaking or readjusting it.

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Education should aim toward social content or value of experience

It may well be asked here what the guiding principle is which controls the remaking of experience, — that is, along what lines, or in what direction, shall experience be re-formed or remade? For those of us who teach children, the answer is that experience has to be remade in the direction of more socialized content. This reply may seem so ambiguous as to have but little value. The objection may also be made that frequently education has for its aim the imparting of knowledge which has little or no social content. Illustration may perhaps throw light upon both points. It is quite possible to teach pupils about the Columbia River without socializing the knowledge thus imparted. There is no special social value in knowing that the Columbia River rises in southwestern Canada, follows a crooked course to the southwest, and flows into the Pacific Ocean. But when we learn what an obstacle this river was to early explorers; that it is not navigable for the greater part of its course; that, because of the salmon which swarm its waters, it is an important source of food supply, we are adding social content to our knowledge. While both sets of facts about the river may be called knowledge, the latter is the more valuable for pupils because it is made up of ideas which have social relation and significance. Doubtless with many of us there comes a time when we value knowledge of facts in their scientific relation without con-

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sidering their social aspects. Advanced students in mathematics and the pure sciences disregard the social possibilities of their subjects, being moved by a highly intellectual curiosity in their researches. Pupils in the elementary schools, however, are not often stirred by this kind of curiosity, and, furthermore, for them the social aspect, or the socialized content, is of more value than the scientific; hence to deluge them with an accumulation of facts which have little or no social meaning is to fail to accomplish the purpose for which the schools were established.

Education should increase the control of the learner over the values which make up experience

Experience cannot be remade nor can content be socialized through the teacher's efforts alone. The pupils themselves must participate largely in the process. Unless the activities of the latter be enlisted, whether these activities be physical or mental, education remains at a low stage. The manual training teacher who contents himself with telling his pupils how to do things is considered a failure. In this subject education is at once seen to consist in the gaining of individual control over the tools and their manipulation. In other forms of education involving physical activity, the same thought or idea is present, — that is, that advance in control by the individual constitutes education. But there are other things besides physical processes and tools to control. There are

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ways of thinking or feeling about things, and ideals of conduct and of art which one must also learn to control in order to be educated. Education is not a thing that can be poured in upon one. Our appreciation is not an accretion; it is a matter of growth, of mastery. Ideals and attitudes are not external; they are a result of internal conquest; they are things mastered or attained through effort. By means of education we establish control over values, or things which we consider worth while, and this control must be established or attained by each individual for himself. For this reason the teacher insists upon each child working his own arithmetic lesson. She plainly sees that it is the control of the individual over the process involved which is valuable. She insists upon his performing his own drawing exercise, because there is no educative value to the individual in having some one else perform his task. The same is true of the other school exercises. It is the gaining of mastery by the pupil over knowledge or process or some other form of worth which constitutes education; hence experience must be remade through increased individual control if the teacher's work is to be complete.

Summary. (1) Starting from the equipment of experience in the form of knowledge, habits, attitudes, and feelings which the learner possesses, education seeks to correct, to extend, to amplify that experience. (2) While some phases of education have scientific knowledge in view, — that is, knowledge for its own sake, — the education for pupils in at least the elementary and high schools should aim

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for social significance in connection with experience. (3) True education has as one of its ends the increase of the learner's control over experience in its various aspects. It furthers his activity rather than compels a passive or merely receptive attitude.

REFERENCES: W. W. Charters, *Methods of Teaching*, chap. I.

EXERCISES

1. How is experience altered in teaching pupils the explanation of the process of condensation? In teaching why smoke goes up the chimney?
2. Show how at least two aspects of experience should be affected in teaching a class about the people of India.
3. What could you teach about coal that does not have social value? What socialized content could you give to the subject? For a class of the sixth school year, which kind of content has greater worth? Justify your answer.
4. How can algebra, history, or Latin be given socialized content in the high school?
5. Make a list of five items which you would regard as socialized content in the study of Siberia.
6. What are the dangers of too much telling and helping in teaching? Where should the line be drawn between *enough* and *too much*?

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IV

MEANS WHICH AID IN EDUCATION

Types of class procedure

THERE are several ways at the teacher's disposal by which he may lead his pupils to the results desired through education. Since education includes the accomplishing of many and varied ends, it is to be expected that the stimuli or agencies used by the teacher will vary, that form of exercise being employed at a given time which is best adapted to secure the object desired at that particular time. A general view of these agencies or forms of teaching exercises should precede the treatment of these individually.

a. The telling exercise or the lecture method. As long as knowledge was the main object striven for, the use of books and of the telling, or lecture, method predominated, and at times was employed to the exclusion of all other means. We still value these modes of imparting knowledge because communication in some form is indispensable in passing on to the rising generation the accumulated wisdom of the society in which it finds itself; but since no one is really learned who can merely recite *verbatim* what he has heard or read, the use of books and of the lecture method has been modified. It will probably never be discarded or en-

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tirely superseded by other modes of teaching, because from books and teachers pupils sometimes learn what they can acquire by no other means. Even if it were possible to obtain the ideas by other means, it is at times more economical and more satisfactory to gain them from reading, or by the so-called lecture method. The objection to this method is that it is frequently employed when it is not the best means of instruction. People attempt to tell what can be learned better by other methods, such as observation or reflection.

b. The object lesson. As the school comes into closer contact with the world in which it is placed, with the life of which it should ever be a part, the study of objects and activities at first hand through observation and participation, or through experiment, is necessary; consequently there must be provision for object lessons, for excursions, for demonstrations, for observation in general.

c. The study of ideas in relation; inductive and deductive lessons. We must make provision in our teaching procedure not only for the study of facts and for the consideration of individual ideas, but we must provide also for the study of things in relation. This relation may be that of structure and function, as in plants and animals; of cause and effect, as in the sciences or history; of similarity of parts, structure, or function, as in the case of minerals, animals, words, geometric forms, geographic phenomena, or the like; or of the individual to the class or family to which it

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belongs, as when we determine the part of speech under which a word should be classified, the family which includes a given animal, or the rule which determines the spelling of a word or the solution of a problem.

When a lesson seeks to find a common element or process in several ideas which groups them together or explains them, it is called an inductive lesson. When, however, the lesson seeks to apply the explanation or principle already known to processes or ideas so as to make them clear, it is called a deductive exercise.

d. The exercise to arouse appreciation. We have been slow in reaching the stage where we realize that the emotions, the sentiments, and appreciations of children are worth taking note of for any other purpose than mere suppression of that which is evil. Our efforts even now are sporadic when we attempt to deal with these aspects of child life. The comic valentine, the ugly picture book, the unspeakable newspaper comic picture, the uncompromisingly plain schoolhouse, the neglected school grounds, the dull matter of the books used, the failure to utilize pupils' sentiments or feelings in our teaching, — these are some of the evidences of our activity in debasing ideals on the one hand and of neglecting them on the other. We are beginning to see that there is a duty here, not only in surroundings and in materials for instruction, but also in the method of teaching. We shall, therefore, deal with that type of teaching which has to do with the cultivation of feel-

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ings, and of appreciation of that which is fitting, beautiful, and noble. We shall include here not only that which is worthy in language, thought, and environment, but in conduct and morals as well.

e. The formation of habits and the increase of skill. Not all of life consists in thinking and in experiencing sentiments. A large share of it is made up of activity, of doing things.

Many of our forms of activity must be reduced to the stage of the automatic; therefore, the teacher who would really train must provide for that phase of education which gives training in applying knowledge, in forming habits, and in acquiring skill. Such instruction is usually called drill. Through drill we strive not only to fix facts and processes, but also to increase skill so as to improve the product of our activity, as in a penmanship lesson.

f. Training pupils to study. It is only within the last decade that much attention has been given to the way by which people arrive at results in their school work. The results alone were emphasized, though probably all teachers felt that there was more or less difficulty experienced by the pupils in getting them, and doubtless many felt their helplessness to aid learners to better ways of working. Some progress has been made in investigating the question of what proper study really is, and enough experimenting has been done with pupils to show that they are capable of employing right methods. We shall, therefore, consider the study lesson

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as one type of teaching. It is the lesson in which the teacher shows the pupils how they may best help themselves.

g. The assignment lesson. We must not overlook in this connection the exercise which prepares pupils for individual study. It frequently consists of a mere statement of the number of pages or paragraphs or problems to be studied. We shall see that it can be made much more helpful than this; that it can not only show what ground is to be covered, but that it can also indicate the sources from which material can be obtained, and that it can put the pupils into such a frame of mind that they will work with interest and energy.

h. The recitation lesson. There comes a time in school procedure when the pupils must present to the class the results of their study, not only to show their mastery of their work, but to give the rest of the class the benefit of their results, to have their ideas corrected if need be, and to give opportunity for discussion and amplification of the material presented. Such exercises are called recitations. There are teachers who make a recitation lesson consist of a *verbatim* reproduction of thought which has been read or heard by the pupils, without discussion, without supplementary ideas being presented, and with little or no explanation. The recitation may and should be much more than this. It should be a period when pupils may present their results before the whole class for considera-

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tion by the class. Through the recitation one of the best opportunities is offered for the remaking of experience; that is, for correcting and extending the ideas of pupils and for influencing their interests and their feelings about things. It is a great waste of a splendid opportunity to limit the recitation hour to the mere repetition of words, and to neglect the thoughts and the emotions which the words represent.

i. The review lesson. The review lesson is that exercise in which the pupil takes stock, so to speak, of what he has been studying, organizes it, so as to bring out the relationships clearly, or possibly establishes new relationships. It may be that in using knowledge already in his possession as a basis for a new lesson, the pupil obtains an entirely new view of this old knowledge, — he re-views it. He sees it from a different angle and its value is thereby increased. The more the pupil is able to use what he has learned by making it the basis for new acquisitions, the more full of meaning his experience becomes. For example, in explaining the movement toward independence in the Balkan States by reference to the movement toward independence in our own country at the time of the Revolutionary War, the pupil is compelled to review his ideas in regard to that period of our history; and since he is going to employ this knowledge as a basis for comparison and explanation, the exercise is much more valuable than if the facts were repeated with no definite purpose in view.

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j. The socializing phases of school work. Those forms of school exercises which attempt to communize the pupils' life and efforts, and to attach social meaning and value to the matter presented, will be considered as socializing lessons. Sometimes these lessons are interpreted as meaning coöperative effort on the part of the pupils. A wider meaning is attached to the term here. Not only may the activities of the pupils be made to assume a social form, but the content, the subject-matter, of the lessons may to a high degree be given social significance, and made to effect social ends.

These exercises not mutually exclusive

It is not to be understood that these types of teaching occur in isolation and that they cannot be combined during a class exercise. A teacher will probably never go very far in a day's program without employing several of them. The hope encouraged here is that making the teacher conscious of these forms and the purposes served by each will cause him to employ them more intelligently and more effectively, to the great advantage of the pupils in his class.

Types of teaching not to be regarded as special methods

The exercises here outlined are not to be regarded as special methods in the sense that one is employed in teaching one subject and that the rest are individu-

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ally employed in the teaching of other subjects. The use of any one of the types is determined by the end to be accomplished, by the response desired, whether it be some form of manual or physical activity, increase of knowledge, or a change in one's moral, æsthetic, or emotional life. Thus, if a habit is to be formed, whether in language, arithmetic, or drawing, drill will be necessary. If objects or processes are to be observed, whether it be in nature study, physics, or sewing, an object lesson will be employed.

The various types of teaching are applicable to several subjects of instruction, not only because similar results are sought in all, but also because the same psychological processes must be employed in the teaching of all of them. We analyze situations or ideas; we associate mental states or activities; we apperceive; we employ analogy as a basis for thinking or acting; we experience various feelings and are influenced by them; we form judgments whether we study geography, history, literature, or art. Those types of teaching which have to do with the gaining of knowledge through observation or experiment may be employed in connection with any subject, whether botany, geography, or chemistry, in which knowledge may be subjected to such processes. The types of teaching which have to do with fixing knowledge so that it will be retained, or with the forming of habits either mental or physical, may be employed in any subject or in any form of activity in which knowledge is to be made

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permanent or habits fixed. In a given lesson several kinds of teaching may be involved, because the procedure may vary with the several aspects of the recitation. One may first endeavor to impart knowledge, then to arouse appreciation based upon the knowledge imparted, and then he may try to put the knowledge into permanent form for reproduction. To accomplish these various ends, different types of teaching are employed. The types are not, therefore, mutually exclusive, since several may occur in the same lesson period.

Summary. The various forms of teaching procedure may be classified as (1) the telling or lecture lesson; (2) the object lesson; (3) the inductive and deductive lessons; (4) the exercises to arouse appreciation; (5) the habit-forming lesson; (6) the study lesson; (7) the assignment lesson; (8) the recitation lesson; (9) the review exercise; (10) the socializing exercise.

These exercises are not mutually exclusive, but may represent various phases of one period of work with a class. They are not to be regarded as special methods, since they apply to any school subject in which they assist pupils to reach the desired ends of education.

EXERCISES

1. Give an example of the use of the lecture or telling method in which you think that procedure was justified. Explain. Give an example of its use which you consider a wrong application of the method.
2. In which of the elementary or high-school subjects can objects or processes be studied directly. Explain briefly in each case.
3. What advantage is there in direct study of objects and processes compared with hearing or reading about them?

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4. Show by an example taken from nature study how the relation of cause and effect may be studied.
5. From an illustration taken from grammar, show how logical relations may be studied inductively.
6. With an example taken from physics or mathematics, show how relationships are studied deductively.
7. Show how relationships of time and place must be considered in the study of history.
8. What forms of appreciation have you definitely tried to arouse and direct in your class within the last year?
9. Name at least five directions in which arousal or guidance are highly desirable.
10. Why not make drill simply incidental to other teaching?
11. Since the mind works according to certain laws, why not take it for granted that pupils will naturally study in the right way?
12. What are the disadvantages of an indefinite, incomplete, or hurried lesson assignment?
13. What relation should exist between the assignment of a lesson and the recitation on the lesson?
14. What faults should you say are common in recitation lessons? Suggest remedies.
15. How would you use review in teaching the outbreak of the war in Europe in 1914?
16. Show how at least four kinds of teaching exercises can be present in one lesson period.

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V

EXERCISES WHICH AIM AT THE DISCOVERY OF GENERAL KNOWLEDGE: THE INDUCTIVE LESSON

The purpose of the inductive lesson

IT is a natural process for people even in early childhood to associate in groups, classes, or families things which are alike in structure, appearance, or use. A child is not very old when he shows that he recognizes certain objects as chairs, whether they be high chairs, low chairs, plain chairs, or rocking-chairs, and whether they be made of wicker, grass, wood, or other material. Certain likenesses of form and use lead him to treat them all as chairs and to apply the same name to all. At an early age he groups things about him into fairly correct classes according to their looks, the way they act, or the uses to which they are put. It is his way of explaining and mastering the world. A thing unrelated is a thing unexplained, and so long as it remains unexplained it is useless.

This process of establishing relationships may simply lead one to group together things which are alike in some external way, as in the case of the chairs just cited. However, it may go deeper into the relationships and produce explanations, principles, rules, ideals, or other general conclusions. When a general

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idea or principle, which applies to several concrete or individual instances so as to explain them or give them meaning, is obtained through the study of concrete or individual instances, the process of thought is inductive. And when a teacher guides his pupils through the study of individual objects or examples to some form of general knowledge, he is employing the inductive development lesson or exercise. Thus the definition of a noun may be discovered by noting the nature of several words of this class, and the rule for multiplying a fraction by an integer may be formulated by pupils after repeated observations of the process in different examples.

Much of the material provided by the course of study should be mastered by this process of induction. The individual ideas or facts have little meaning when simply observed or memorized and then passed by. It is the meanings, the explanations, the relationships which are of value, since by their aid other facts are to be understood, and by them one's activities are to be determined. Then, too, it is important that pupils master the process of inductive study, since through it they can carry on investigations independently of any teacher. It is one of the most valuable means of establishing control over ideas.

Teachers sometimes say that very little of the subject-matter affords opportunity for inductive treatment, but this statement reveals the teacher's ignorance of the pupils, and also of the necessities of the

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course of study. Even the subject of spelling, in which the work is about as disconnected as possible, involves several rules of pronunciation, rules for forming plurals, and rules for spelling, all of which can be learned by observing a number of words and discovering the rule from its use in these words. Grammar contains many rules and definitions, and these are in most cases, if not in all, best learned inductively. The same statement holds true in regard to the many rules involved in the study of arithmetic. Nature study, while not intended to be a scientific study of natural phenomena, calls frequently for the "why" and the "how" of things, and sometimes involves comparisons which lead to classification; as when the rat, mouse, squirrel, and rabbit are discovered to have several features in common, or the hollyhock and the common mallow are discovered to be surprisingly alike. A certain kind of foot is soon discovered to be characteristic of birds that are swimmers, while the wading birds are easily recognized from the structure of legs and feet.

In language the manner of writing headings, the idea of a margin, the indentation of a paragraph, the use of capital letters, and similar concepts can be learned effectively by the inductive process, as can also the ideas of introduction, of thought sequence, and numerous other features which are properly a part of the subject called English. The general structure of a drama can be determined by the study of several classics representing this form of literature.

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What is meant by narration, description, and the like can be made very plain through direct study of writings of these types.

Geography and history, so frequently merely memorized, can be filled with meaning and worth if inductive reasoning be employed in their study. They contain underlying principles and fairly bristle with questions, the solution of which involves inductive reasoning. Why was there so much delay in settling and developing the land west of the Mississippi River? Why did the people of France overthrow the government and put Louis XVI to death? Why did the people of the Northern States oppose the extension of slavery? Why were not all of the Americans in favor of separation from Great Britain in 1776? Why do not all places equally distant from the Equator have the same climate? What effect do mountains have upon temperature and rainfall? These are a few of the many questions whose answers may be obtained through inductive reasoning on the part of the pupils; that is, reasoning which seeks to formulate rules, principles, definitions, or other general explanations and does not seek to apply general principles already known.

The formal steps involved in inductive teaching

Certain steps have been found helpful in employing the inductive form of reasoning in teaching. These steps have been formulated and advocated by the Herbartian school of educators. They are known as

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the *formal steps* of instruction, and consist of (1) the preparation; (2) the presentation; (3) the comparison; (4) the generalization. There is a fifth step, called the *application*, in which the results of the inductive process are put into operation, or are applied. As the step of application is essentially deductive, its consideration will be deferred to a later chapter.

a. The preparation. (1) In the step of preparation the teacher *prepares the class* for the study of the new material. This step does not mean the teacher's preparation of *himself* for the lesson, but rather his preparation of the class. It does not include the teaching of the new subject-matter. It merely paves the way for its consideration. Briefly stated, the preparation should bring the class to realize the need of certain knowledge; to face a problem which must be solved; to ask "how" or "why"; to seek an explanation or a mode of procedure. Pupils are led to discover their own ignorance or inability in regard to some particular knowledge or process. Frequently they can frame the question which should form the starting-point for the lesson which is intended to satisfy the need that has been brought to consciousness. It may be necessary for the teacher to state it, but if the problem or difficulty or lack is keenly felt by the class, some pupil or pupils will usually ask the question. The teacher will grow in skill in leading the class to feel their need, and to frame the questions which lead to its satisfaction.

Since the question, or statement of the problem,

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which constitutes the aim for the new lesson is to be based upon the conscious need of the pupils, it is clear that the statement of the aim will occur either at the end of the step of preparation or during its course; and that it will be rather unusual to have it occur at the beginning of this step, where many people have tried to place it.

(2) In addition to bringing the class face to face with a problem, the preparation should include the recall of knowledge which is related to the new lesson and which will aid in its mastery. This knowledge recalled, made clear, and organized ready for use, gives the background for the advanced work. It is the apperceiving basis for the understanding of the new knowledge which is to be gained. The pupils who were going to find out in the new lesson why Louis XVI of France was put to death by his people recalled, as a part of the step of preparation, what they knew of the overthrow of Charles I, of the reasons for the separation of the American colonies from the English Crown, and of the causes for the Cuban struggle for independence.

The step of preparation may occupy a longer or shorter time, depending upon the number of ideas to be reproduced, and the amount of work which must be done to reproduce them and make them clear so that they may serve as a basis for the comprehension of the new lesson. It may not take more than the statement of the aim or problem to bring the old knowledge to mind in the desired state. On the other hand, the

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preparation may occupy an entire lesson period, or even several periods. One cannot say safely or wisely that he will devote a quarter or a fifth of the whole lesson period to this one step. Just that amount of time may be required, but more or less may be needed. The work should move along promptly, occupying only as much time as is needed to bring out the problem and to review the knowledge necessary for the advanced work. Digressions and side issues should be avoided, and attention should be held closely to the work in hand. Whether the time be long or short, the step has been accomplished when the pupils are clearly conscious of an aim, and have in mind ready for use the ideas that are to serve as the background for the new facts which are to be taught.

b. The presentation. (1) Teaching the new facts or ideas to the class constitutes the step of presentation. In order to learn these facts the pupils may study individual examples or objects, as in nature lessons or spelling; they may perform experiments, as in physics or chemistry; they may work out processes, as in arithmetic or cooking; they may take excursions and have observation lessons, as in geography, botany, or geology; they may study concrete ideas previously learned and later reproduced in order to furnish material for the lesson, as in studying the ways by which heat is produced. The teacher may resort to telling in order to bring the facts before the class, although this mode of teaching should be used sparingly as observation and

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experimentation by the pupils produce much better results. The teacher frequently resorts to telling because it seems to him a short and certain way of making the children acquainted with the new knowledge. However, the results show that it is often the least certain of all the possible modes of presentation, as mere telling does not insure understanding.

(2) The step of presentation must include enough examples, processes, or concrete cases to make the traits possessed in common very clear. Any one who has tried to teach long division knows the futility of expecting a class to master the process by working one example. On the other hand, the observation of the kind of teeth found in the mouth of one cow, with the consideration both of the uses which they serve and the cow's method of grazing, might justify the conclusion that all cows must have the same kind of teeth. There must be *enough facts to teach clearly and surely the lesson desired.* This rule must be the teacher's guide.

(3) Another principle to guide the teacher is that the material must be varied enough to make the conclusion correct and representative. It is a common occurrence for teachers to try to develop the idea of pronouns by giving examples of personal pronouns only, and frequently limiting these to the third person, disregarding the fact that pronouns may be of the masculine, feminine, or neuter gender, or of the first, second, or third persons, and of either the singular or plural number. If one is teaching rivers, it would be

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better to study one river that flows into the ocean, one that flows into an arm of an ocean, one that flows into another river or lake, and one that is lost in a plain, rather than to have all of the same kind.

(4) Sometimes teachers have difficulty in the step of presentation because they do not select the material in which the traits upon which the rule, principle, or definition must be based, stand out prominently; or they are so obscure and indefinite in their treatment of the material that they becloud rather than illuminate the points which should be made clear. The irrelevant and the unimportant should be avoided and attention should be centered upon the significant and relevant facts. Anything which diverts attention, or stands between the mind and the ideas it is to master, is a hindrance. Showy experiments, complicated apparatus, involved sentences, difficult examples, lack of clear and concise meaning, are common faults found in inductive teaching. In presenting new facts about sentences, the examples should be simple in thought and should not contain strange words. In teaching a new process in arithmetic, the numbers and the thought involved should be simple so as not to interfere with the concentration of attention upon the process. Reducing the number of questions asked, and making the rest very clear and to the point, help to direct rather than divert the minds of the learners. The teacher should, therefore, give thought to his questions before the lesson period, and decide definitely upon the form

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of those which are most essential in bringing out the ideas to be gained.

At the close of the step of presentation, the pupils should have gained a clear knowledge of the elements in the examples studied which are necessary to the formation of the general idea. Should the inductive process go no further than the step of presentation, the children will have gained at least an intimate acquaintance with a large and varied body of individual ideas and objects.

c. The comparison. (1) In the step of comparison the pupils are made clearly aware of the elements or processes of the examples studied in the preceding step which are common to a class or group. Thus, the pupils in history who were studying the French Revolution, found during the step of presentation that the French people had objected to long-continued tyranny, and had set up a new government in which the rights of the people were to have more recognition than under the old form. In the step of comparison, they found that the English under Charles I had done the same; that the Americans under George III, and the Cubans under Spanish control, had worked for and attained similar results. They discovered tyranny on the part of all the governments, various attempts to overcome it on the part of the people in each nation; and, as it happened in each of these cases, they found that the oppressive power was finally overthrown after protracted struggle. In learning long division the pupils,

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through comparison, discover that they divide, then multiply, then subtract in each example, and then write down the new figure in the partial dividend, and that they then repeat the four steps in order until the division is completed.

(2) This process of discovering the essential common elements is frequently aided by placing the examples or objects studied in a position favorable to this purpose. Thus, writing the words *receive, deceive, perceive, conceive* in a column serves to show the similarity in spelling. The observation of likeness is effected at times by introducing a striking contrast. Thus, the introduction of a scratching bird into a group of swimmers may serve to call attention to the similarity of foot structure in the latter group, a fact which the pupils may have overlooked. Writing the answers in a definite position in division of decimals helps to master the process of determining the number of decimal places in the quotient. Sometimes contrast is an aid, as when the word *fife* is inserted in the list when teaching the formation of the plurals of nouns ending in *f* and *fe*, such as *wife, wolf, loaf, leaf, half*.

(3) It sometimes happens that teachers carry an inductive lesson through the steps of preparation and presentation, and then perform the step of comparison themselves, thus depriving the pupils of needed exercise and weakening the effect of the work. In consequence the pupils often do not see the resemblance at

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all, or else receive so feeble an impression that they do not retain it, and consequently the process fails of its purpose. If material is worth an explanation, or leads to general ideas which are valuable, then the pupils should discover the characteristics or processes upon which the explanation or generalization is based. The teacher should so arrange the material, and so direct his questions, that the pupils will be aided in seeing the important facts; but he should not state them himself in the vain hope of saving time.

d. The generalization. (1) Following the step of comparison comes the step of generalization in which are summed up the results of the previous steps. If the pupils have been trying to find out why, in multiplication of decimals, as many places are pointed off in the product as the sum of the decimal places in the multiplier and multiplicand, it is in the step of generalization that the explanation is definitely stated. If they have been learning to multiply a fraction by a fraction, it is in this step that they express the rule for such multiplication. It is in this part of the inductive process that the pupils should formulate the statements for the agreement of verbs with their subjects, the agreement of pronouns with their antecedents, the rule for the formation of plurals, the effect produced when an acid and a base are united, the nature of heat, the law of falling bodies, the conditions necessary to plant growth, the influence of altitude upon climate, the relation between products and industries, and the

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maxims and moral truths which result from the study of human actions, such as "Taxation without representation is tyranny," "All government derives its just powers from the consent of the governed," or "It is wrong to steal."

(2) At times, even though the comparison has shown clearly the points which are essential to a general conclusion, the pupils stumble over the wording of the rule or principle. When the class which was studying the story of the French Revolution reached the place where some conclusion should be stated, one pupil worded it thus: "Any fellow that tries to be a boss is going to get it." When it is clear that the pupils have the idea, they should, if necessary, be helped to a proper wording of it. Then the rule, or law, or explanation, as given in some textbook, may be compared with the statement made by the class, or the suitable maxim or adage may be committed to memory.

(3) The suggestion has just been made that the pupils may compare their own conclusions with the conclusions reached by other people. Such a reference serves as a verification of the results obtained by the pupils and is valuable on that account. This verifying of conclusions is the test of the whole process of inductive thinking, as it sets the seal of comparative certainty upon it. Experiment and observation are excellent forms of verification. When they are not possible or advisable, the conclusions of others, as found in reference books, encyclopædias, dictionaries, maps,

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charts, tables, and the like, may be utilized. It is frequently the case that the pupils verify their results by conferring with one another, or with people in the home or community.

Advantages of this type of lesson

The inductive process may seem long and arduous to teachers, and it may seem much more economical for them to give the explanation to the class, or to state the rule. In reality the time consumed for covering the four formal steps involved in the inductive process may be short, requiring only a few minutes. In actual practice is demonstrated, also, the futility of the teacher's telling and explaining. Probably most teachers tell their pupils to observe the margin when writing, to begin each sentence and every proper name with a capital letter, and to use an interrogation point after a sentence which expresses a question. Does this telling suffice, or do pupils fail to grasp the ideas and keep on year after year violating all these rules? Pupils in the grammar grades and in the high schools often show by their practice that they have not learned these simple laws of composition in such a way as to secure their application. How long would it take to have them observe margins in their textbooks and then state the rule for the use of the margin; to have them discover for themselves by definite searching that proper names are begun with capital letters? After such training, if a pupil forgets, he can be taken back

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to the same source to refresh his memory. The telling method has not sufficed even in cases so simple as those just cited, and consequently time has been lost year after year.

The knowledge resulting from induction is literally the pupils' own because they have created it by their study. It usually possesses more meaning and permanency than it otherwise would. The results furnish the principles necessary to explain concrete instances and problems which are met later. Then, too, through use, pupils learn the technique of the process of induction, and have a method by which they may independently study their environment.

Limitations of the method

Teachers may occasionally resort to induction when the material is not valuable enough to justify it; that is, they are not content at times to bring the children into contact with individual ideas that are interesting and worth while in themselves, but try to force conclusions which either are not valuable or which the material never was meant to yield. Thus to try to derive a lesson on table manners or morals from the story of *Alice in Wonderland* is absurd. When the inductive process was introduced into this country in the form of the Five Formal Steps, many teachers carried its use to the extreme and attempted to apply it to all material, thus making the work exceedingly formal and difficult. At the present time the

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pendulum has swung too far in the opposite direction, and teachers attempt to acquaint their pupils with general conclusions and ideas without providing an adequate basis of concrete ideas.

There is certain material which should be carried no further than the step of presentation. The pupils should know it just because it is interesting of itself, or is interesting for the time being; but, as has already been pointed out in this chapter, there is much subject-matter to which the complete inductive process should be applied. Teachers may occasionally resort to induction when the material is not valuable enough to justify it; but experience shows that the error lies rather in not using it enough, and in attempting to tell, instead of leading pupils to think, and to discover explanations and conclusions for themselves.

Summary. (1) The purpose of the inductive lesson is to aid pupils to master values, to reorganize experience by discovering logical groupings, and by working out the principles, rules, definitions, or other forms of generalization which explain classes of ideas or processes. (2) The steps in an inductive lesson are (*a*) the preparation, (*b*) the presentation, (*c*) the comparison, (*d*) the generalization. (3) The advantages of this type of teaching are that the pupils know thoroughly what they know, that they are provided through it with the means of solving concrete problems later, and that they learn through its exercise a logical method of working. (4) It is useless and unwise to try to employ inductive teaching with all material, since not all subject-matter possesses logical value. Some subject-matter has value which is temporary, or which is æsthetic rather than logical.

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REFERENCES: C. A. and F. M. McMurry, *The Method of the Recitation*, chapters II–VIII; W. C. Bagley, *The Educative Process*, chap. XIX; John Dewey, *How We Think*, chap. VII; E. L. Thorndike, *Principles of Teaching*, chap. X.

EXERCISES

1. Examine textbooks in grammar and arithmetic and name any which employ the inductive method to develop the rules and definitions.
2. Give arguments for and against placing the statement of the pupils' aim at the beginning of the step of preparation.
3. Give illustrations of at least four ways by which the students may learn the facts about the individual cases studied in the step of presentation.
4. What advantage, if any, exists in having variety in the objects studied preparatory to forming a general conclusion?
5. Write a list of sentences which you would use to teach the idea of *adverb*.
6. Examine the sentences to determine (1) whether you have illustrated all the uses of the adverb; (2) whether you have given sentences enough to make the different uses clear; and (3) whether you have varied the forms of the sentences sufficiently to help the pupils gain the desired ideas, or whether you have used practically the same type of sentence with the adverbs located in the same place throughout.
7. How can you help pupils gain the knowledge of likenesses and differences without telling them?
8. When pupils have, through induction, gained the idea desired, how are they to obtain the name which applies to the idea; that is, when they discover that a certain class of words can be used in place of nouns, how will they get the name pronoun?
9. How many forms of general knowledge such as rules, laws, do you know? Make a list. Compare with others.
10. Would you ever accept from pupils a generalization made by them which is correct but which is crudely worded? Why, or why not?
11. How can pupils be aided in good wording of conclusions?
12. What generalizations have you ever had pupils verify? Have you been in the habit of verifying your own?
13. What advantages are there in learning to verify conclusions?

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VI

LESSONS IN WHICH GENERAL KNOWLEDGE IS EMPLOYED: THE DEDUCTIVE LESSON

What is meant by deduction

ONLY a part of the process of education consists in the formation of explanations, principles, theories, and other methods of controlling experience. A very important function of training is to teach students to master difficulties by employing those forms of control established either by the students themselves or by others. This process of solving a problem, of overcoming a difficulty whatever its form, by bringing to bear upon the problem or difficulty some conclusion already formed, is known as the deductive process. The teacher resorts to it whenever he causes his pupils to answer questions, solve problems, or master the puzzling situations which confront them by referring to rules, principles, laws, axioms, or other general conclusions already in their possession. A relation is established between some more or less concrete idea and the fundamental truth upon which it rests. The application of the truth is thus extended and the concrete idea acquires the meaning which it did not before possess; that is, the meaning of the class to which it is assigned. A teacher asked a class, which was studying Homer's

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Odyssey, whether Ulysses, whose men had gone to the palace of Circe the enchantress and had not returned, would not sail away in fear lest some misfortune might occur to him also. "No," was the answer. "He would not go away because he was a good leader and a good leader does not desert his men." Here the fundamental idea is that a good leader will not desert his men. By relating the idea of Ulysses to this truth, the pupil found his answer. The process is clearly deductive. By use of it, new light is thrown upon the character of Ulysses, since he, having been put into the class of good leaders, has ascribed to him thereby the traits of the class. Also, when the child's judgment that Ulysses would not desert his men was confirmed by referring to the narrative, the fundamental idea about good leaders was strengthened, so that the pupil might well have exclaimed, "Did I not say a good leader would not desert his men?"

Deduction in its relation to the inductive process

This process of deduction is related very closely to that of induction, so closely, in fact, that the inductive lesson is not considered complete until the step of application has been taken, and that is essentially deductive. When all of the five formal steps — namely, preparation, presentation, comparison, generalization, and application — have been employed in a lesson, the whole process is usually called the inductive-deductive lesson. During the steps of presentation, comparison,

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and generalization, the abstract idea or general principle is formed. In the application, this idea is employed to explain individual situations or examples, to give the right clue to action. When pupils have learned what a pronoun is, they apply their knowledge by identifying pronouns occurring in lists of words, in books, or in their own oral speech. When they have learned how to reduce fractions to their lowest terms, the application consists in the actual reduction of fractions to their lowest terms. Words should be recognized by pupils as pronouns *because they are used in place of nouns;* and the reduction of a fraction, as $\frac{14}{20}$, to its lowest terms should be based upon the law that a fraction is reduced to its lowest terms by dividing both numerator and denominator by the largest number that will exactly divide both. When pupils make such use of their knowledge, they are reasoning deductively.

It is sometimes the case that the deductive phase of teaching occurs in very direct relation with the inductive lesson in the form of the application of the truth just formulated. Thus, after the statement of a rule or definition in grammar or rhetoric, or a rule in arithmetic or algebra, there is often a list of examples involving the use of the definition or rule. But deduction is frequently involved in situations which are not so neatly collected and labeled, and in which the principle which must solve the problem is not furnished ready for use and printed in italics. It must be searched out

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of past experience and fitted to the case in hand. If a person should be asked to explain how a pump works, or why water boils at a lower temperature in Denver than in New York City, he would probably have to reflect for a time before finding the right explanations even when he has them safely memorized. It takes searching to find the reason that applies. This is the constant experience of the doctor, the lawyer, the engineer, of people in every walk of life. Problems arise in miscellaneous fashion, and the guiding principles must sometimes be sought long and earnestly before they are found.

Steps or stages in a deductive exercise

a. The problem. First of all, there is a problem to be solved, a situation to be met. This must be clearly felt by the pupils, as they are to engage in the deductive process of reasoning, and that requires the consciousness of a problem that must be satisfied in the mind of the person who is to employ the deductive process. This problem may not be more complicated than the necessity of finding the cost of one orange when six oranges cost thirty cents; of determining whether *I* or *me* should be used after *and* in the sentence, "The picture was given to you and —"; of deciding what colors to mix in order to produce green.

b. The study of details and principles. Many mistakes in life are made because of the attempt to apply remedies, to make explanations, or to rush into action

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before the thing which is to be done or explained or remedied is clearly understood. We need to know the facts in the case before we can choose the right course or the proper basis for the solution of our difficulty. We must collect data bearing upon the problem. The physician observes his patient with care, seeking many details and frequently resorting to the use of specially adapted instruments in order to secure these details before he goes further with his diagnosis. Before the engineer can safely decide upon the kind of bridge to build, he must ascertain many facts about the place, the height of the banks, the nature of the bed of the stream, the amount of water at different seasons, the pressure to be expected from ice, the kind and amount of traffic for which the bridge is intended, and many other points. So the pupil who must classify words must find out the facts necessary for that purpose. Does the word modify? If so, what kind of a word does it modify? It is useless to look for the class until the essential details are known. Until the significant facts about New York and Denver are known, there is no clue to the physical principle which explains why water boils at a lower temperature in one city than in the other.

c. The hypothesis or inference. While examining data, another phase of deduction keeps coming into activity. It is the attempt to apply to the solution of the problem at hand some principle or explanation connected with the data discovered. This step is

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known as inference, or the forming of an hypothesis. Every teacher's experience bears testimony to the statement that pupils need training in the process of associating the given facts with the right principles. Young people guess wide of the mark, are irrelevant altogether, or find theories which are not adequate. To the question, "What conditions make it possible to grow rice in Texas?" the answer is suggested, "Texas is the largest State in the Union." This reply is no more irrelevant than thousands of explanations suggested by pupils not only in elementary schools but in higher schools as well. The explanations do not explain; they do not apply. Instead of rejecting such replies at once, the pupils should be helped to realize that, starting from the data given, they must seek for an explanation which bears upon the problem. Thus the word to be classified is found to be a word which modifies. The pupil may conclude at once that it is an adjective because adjectives are modifiers. Further search for facts reveals that the word in question modifies a verb. The adjective hypothesis must then be discarded in favor of the idea that the word must be an adverb, because words which modify the meaning of verbs are adverbs. The more or less scientific guess or explanation offered can be regarded merely as an hypothesis, or inference, that is, a tentative theory which must be examined to see if it meets the situation. The pupil who gives *size* as the reason for rice-growing in Texas should be required to explain how

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that factor applies to the situation. He then discovers his own error.

The fraction $\frac{24}{30}$ is to be reduced to lower terms. The class stumbles over the process. "How is a fraction reduced to lower terms?" asks the teacher. "By multiplying both terms by the same number," answers a pupil. "When the fraction is reduced to lower terms will the numbers be larger or smaller than they now are?" "They will be smaller." "If you multiply both terms will the resulting numbers be larger or smaller than in our fraction $\frac{24}{30}$?" "They will be larger." "Will multiplying reduce the fraction to lower terms?" "No." "How can numbers be reduced?" "Either by subtraction or division." "Which of these processes should be employed in the reduction of fractions to lower terms?" "Division." "How is a fraction reduced to lower terms?"

In this instance the pupil has been compelled to examine his rashly stated inference, to see what it means, and to decide whether it is the right one for the situation. One of the things he should learn to do frequently in life is to make his inferences with care. The teacher who cuts short the process by saying, "No, you do not multiply, you divide in order to reduce fractions to lower terms," deprives pupils of needed training, though he may have helped to a quick answer.

d. Verification of hypothesis finally selected. The next step in deduction follows closely and quickly upon the discovery of the right principle. What is known to be

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true of the class to which the problem belongs is inferred to be true of the problem, and the latter is solved by applying the principle. In the example of reduction just given, the questioning stopped with the statement of the rule for the reduction of a fraction to lower terms. In verifying his inference, the pupil divides both terms of the fraction by the same number, and examines the resulting fraction to see if it is really expressed in lower terms than the original. The solution of the problem or difficulty constitutes a verification of the reasoning process employed. If the pupil, after dividing both terms of his fraction by the same number, finds the new numerator and the new denominator to consist of smaller numbers, he knows he has reduced his fraction to lower terms. The man who invents a new process for the manufacture of steel verifies his theory by the actual making of steel. The man who derives a cure for tuberculosis accepts or rejects it by its effects upon tubercular patients.

But not all verification works out so visibly. In moral and æsthetic problems, one's self-approval or feeling of satisfaction is often the test of the theory selected and applied. Combinations of colors or tones for certain purposes are due to custom, or to individual taste. They cannot be verified by appeal to logic; but they may be approved if they are found to conform to accepted standards.

A negative form of verification is the absence of any ideas or elements in conflict with the theory adopted.

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This fact suggests that it is advisable to look for data which oppose the hypothesis formed. A simple experience in physics illustrates this point. Some water in a tightly corked bottle was heated until it boiled. It was removed from the fire and held under a stream of water. The water in the bottle boiled furiously. The children inferred that the stream of water must be hot because it is always the application of heat which makes water boil. Investigation proved to them that the stream of water was cold. To find that heat causes water to boil is one theory. To find that nothing else does so is quite another. Children may be justified in accepting a given explanation upon the basis that they can find nothing to contradict it. Scientists have a long list of hypotheses which they justify because there is nothing to oppose them; so, while they cannot prove that they are true, they nevertheless employ them.

In order to confirm his own solution of a difficulty, or to discover contradiction, a pupil submits his results to others. He talks his solution over with his fellows and compares results. He seeks the teacher's opinion or the opinions of people outside of school. He refers to books. In brief, he looks to the experience and judgment of others for confirmation or correction of his solution. It is right that he should do so, though he should not do it to the extent that he forms the habit of giving up his own conclusions as soon as he discovers opposition. Giving up conclusions should be as rational a process as forming them.

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Use of textbooks in deduction

To reason deductively, to meet situations by employing general principles, implies that pupils have these principles at their disposal. Through the process of inductive thinking, whether outside of school or with the teacher's assistance, they acquire a large number of general notions. However, there is not time enough to develop all that they need, and furthermore, they can employ theories which they are not mature enough or experienced enough to evolve. These they must obtain from some available source, and then use. They must rely on some authority at this point, whether it be the teacher, the textbook, or some other help. The problem once presented itself in the writer's experience of finding the contents of a car of oil, the car being in the form of a recumbent cylinder, of given length and diameter and lacking several inches of being full. Had the cylinder stood on one end, the solution would have been easy; but it rested on the side, and no rule was known to the writer that would get the answer, and the answer was imperative. A textbook on engineering was consulted and the formula which applied to such problems was found and applied. It is quite conceivable that pupils in school might need just such a formula, and that they might not have the knowledge of mathematics necessary to help them derive it inductively. They need to learn where to look for such helps, and they need to recognize their suitability when found.

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Suggestions in regard to the use of the deductive process

What should the teacher do to aid pupils in their efforts to think deductively? In the first place, he should discover before class what places in the lessons afford really good opportunities for using the process. Grammar and mathematics thrust opportunities upon the class, but geography, history, and the other subjects are not so openly deductive. When the teacher has decided upon the situations that are necessarily deductive, or that can be made so to the gain of the class, he must so shape the work with the class that the pupils will come upon the problem or situation which requires solution or explanation or decision.

The pupils will probably need some help in the various steps: first, in seeing just what the situation is; second, in choosing the right principle; third, in making the inference and in solving the difficulty; and, lastly, in the verification. While the steps ought not to be made too easy, and while there ought not to be too many suggestive questions which ignore the ability of the pupils, still some assistance is often necessary. The pupils sometimes grope blindly for the general idea which gives the solution. They do not know which way to turn or to look. The teacher needs to guide their search and sometimes to suggest possibilities for consideration. As the class grows in skill, the teacher should withdraw more and more from this helping and guiding process in the selection of princi-

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ples. He should insist upon the application of the theory selected to the case in hand, not only for the sake of the solution of the problems to be solved, but to further the habit on the part of the pupils of testing their choice of theory in actual use. He can help them verify their results, not merely by passing judgment himself, but by suggesting means of verification and by holding pupils to verification when verification is necessary and feasible.

It is possible that most teachers use the deductive process more frequently than they are aware. It may be that induction has been emphasized so much that the deductive lesson has not received due consideration, and that its importance has been overlooked. It is a necessary means of working out puzzling situations, of solving difficulties, of reasoning out new knowledge, and our pupils need all the training possible along just such lines. By their own acquired wisdom and by the wisdom of the race, they may meet and solve life's knotty problems if they know how to utilize this wisdom.

Professor Dewey gives us this very helpful suggestion in regard to the use of deduction: —

> In other subjects and topics, the deductive phase is isolated, and is treated as if it were complete in itself. This false isolation may show itself in either (and both) of two points; namely, at the beginning or at the end of the resort to general intellectual procedure.
>
> Beginning with definitions, rules, general principles, class-

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ifications, and the like, is a form of the first error. This method has been such a uniform object of attack on the part of all educational reformers that it is not necessary to dwell upon it further than to note that the mistake is, logically, due to the attempt to introduce deductive considerations without first making acquaintance with the particular facts that create a need for the generalizing rational devices. Unfortunately, the reformer sometimes carries his objection too far, or rather locates it in the wrong place. He is led into a tirade against all definition, all systematization, all use of general principles, instead of confining himself to pointing out their futility and their deadness when not properly motivated by familiarity with concrete experiences.

The isolation of deduction is seen, at the other end, wherever there is failure to clinch and test the results of the general reasoning processes by application to new concrete cases. The final point of the deductive devices lies in their use in assimilating and comprehending individual cases. No one understands a general principle fully — no matter how adequately he can demonstrate it, to say nothing of repeating it — till he can employ it in the mastery of new situations, which, if they *are* new, differ in manifestation from the cases used in reaching the generalization. Too often the textbook or teacher is contented with a series of somewhat perfunctory examples and illustrations, and the student is not forced to carry the principle that he has formulated over into further cases of his experience. In so far, the principle is inert and dead.[1]

Summary. (1) By deduction is meant the establishment of control over individual ideas or situations through the application of principles, rules, definitions, laws, axioms, or other forms of general knowledge possessed by the individual who makes the application of them to the concrete case. As

[1] John Dewey, *How We Think*, pp. 98–99.

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the result of the process, the individual case takes on larger meaning, and the principle or law is broadened in application. (2) Deduction is intimately related to induction. This relationship should be maintained in the teaching process. The inductive process is not complete until it terminates in general knowledge. This knowledge should be employed in the interpretation of individual problems such as gave rise to the inductive process. (3) The steps in the deductive process are (*a*) the realization of a problem; (*b*) the study of details and the search for principles, rules, laws, or definitions which will explain them; (*c*) the formation of an hypothesis or inference; (*d*) the verification of the hypothesis or inference. (4) Textbooks afford frequent opportunities for the exercise of the deductive process. They frequently give results of inductive reasoning which pupils usually accept without question. Such books should afford many problems requiring deductive effort. Furthermore, textbooks contain statements of rules, laws, principles, and definitions to which students should refer for verification of their own efforts, and for aid in solving their difficulties. (5) The teacher is cautioned not to attempt the omission of the deductive process in order to hurry the pupils forward to correct answers. Pupils need training in reasoning quite as much, or even more, than they need some of the answers. They need assistance and patient treatment while exercising the different steps of the process. The suggestion is made that the teacher guard against excessive employment of deduction in his own teaching procedure, that is, against trying to force into use general forms of knowledge for which the pupils are not prepared. It is also suggested that pupils be led to use freely the underlying ideas they already possess in the mastery of new situations. We must guard against two evils in connection with the employment of deduction; namely, trying to use general principles before the pupils possess them, and, secondly, omitting to use them when pupils do possess them.

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REFERENCES: C. A. and F. M. McMurry, *The Method of the Recitation*, chap. IX; John Dewey, *How We Think*, chap. VII; W. C. Bagley, *The Educative Process*, chap. XX; Colvin and Bagley, *Human Behavior*, chap. XVIII; L. B. Earhart, *Teaching Children to Study*, chap. III; W. W. Charters, *Methods of Teaching*, chap. XIV; E. L. Thorndike, *Principles of Teaching*, chap. X; G. D. Strayer, *A Brief Course in the Teaching Process*, chap. VI.

EXERCISES

1. Cite an instance when a teacher should have required pupils to explain a situation by means of general knowledge already in their possession and failed to do so.
2. Cite an instance when a teacher attempted to have pupils explain a situation through a principle or rule which they did not possess or clearly understand.
3. Does failure to classify a word as a verb always mean that pupils do not know the definition of verb? What else may it mean?
4. What objection is there to telling a class that if equals be added to equals the results will be equal, and then giving two or three illustrations to show what is meant?
5. A certain writer maintains that when general truths may be grasped as readily as the one stated in the preceding exercise, it is advisable to state them simply and clearly and then illustrate what is meant. Do you agree with him? What advantage is there in this plan, providing it works successfully?
6. Give instances of the use of deduction following induction in five school subjects.
7. Why should there be a careful study of the individual instance or example in deduction?
8. What mistake or mistakes are likely to be made in connection with forming the hypothesis or making the inference?
9. How can you help pupils guard against the mistakes mentioned in exercise 8?
10. Why should inferences be verified?
11. Suggest several ways in which the conclusion may be verified.
12. In teaching, which type of exercise should predominate, — the inductive or the deductive?
13. What difficulties do you foresee in the application of general truths learned by the inductive process?
14. Through which process of learning, the inductive or deductive, have you profited most? Suffered most in expenditure of time and energy?

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VII

THE STUDY OF OBJECTS AND ACTIVITIES

The nature of the object lesson

THE object lesson is a teaching exercise which aims to increase knowledge by the direct study of material, processes, or conditions. Such a lesson might be given in botany with the plants present to observe; in physics, with the apparatus before the class and the experiment performed; in chemistry, with the action of one substance upon another demonstrated; in geography, through the observation lesson in which the pupils see for themselves the forms of land and water, or the action of water upon soil and rocks. A visit to a mill, a shop, a store, or a ship, to see what is done and how the work is performed, is an object lesson. Trips to the aquarium, the museum, the zoölogical garden, the botanical garden, and the lessons in the school garden all belong in this category, as do also many of the lessons in cooking, sewing, and manual training.

Through these lessons pupils should gain intimate acquaintance with a wealth of concrete material in their environment. The resulting knowledge should be all the more clear because several senses have been active in acquiring it. Sight and hearing, and frequently taste, smell, and touch, add their quota to the

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fund. Mere telling or reading or picture study cannot impart the vividness, the details, or the interest that come from seeing things for one's self, and of being a participant at times in the processes which bring about results.

The relation of the object lesson to the inductive lesson

Since the objects studied must be related to knowledge already possessed in order to be understood, and since the ideas gained are derived from the analytic study of the material itself, the object lesson involves the first two steps of the inductive lesson, — the steps of preparation and presentation. Frequently the knowledge gained from the study of concrete material and processes is used as a basis for comparison, generalization, and application, and in that case all of the formal steps are employed. Many times a single form — as a stream, a mountain, a plant, or an animal — is studied thoroughly, and is then made to serve as a type for similar objects, thus furnishing a core for later comparisons and generalizations. The teacher may never attempt to base a general conclusion upon the object studied, but, through the natural tendency to reason from the concrete to the abstract, the pupils in the course of time may of themselves use the results of the object lessons to derive classifications, explanations, or laws.

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The need of the step of preparation in the object lesson

Much of the so-called nature study in our schools serves as a sad warning as to how object lessons should not be conducted. With no preliminaries whatsoever, the pupils are expected to be interested in the object presented and to see just what they ought to see. With no ideas in mind to serve as a means of explaining the new facts, and with no live motive for observation, they either give a list of the anatomical parts, or recite in perfunctory fashion from a cut-and-dried outline. Why should there be an object lesson unless the thing to be observed has value either in the purpose it serves directly, or in its relation to other objects or processes? Granted that the lesson is to be conducted for the purpose of mastering some value, there must, then, be preparation of some kind to arouse the motive, or feeling of need, that will be satisfied through the lesson. A lesson on the canary will not consist of the statement that the bird has feathers, bill, and feet, but will be conducted, possibly, to find out why people keep canaries as pets, and how these birds should be cared for.

Not only must the motive be aroused in the minds of the pupils; the related ideas which form the basis for the understanding of the new knowledge which is to be gained must be recalled, as explained in the chapter on the inductive lesson. If two classes of levers have been studied and a third one is to be presented, the relevant facts about the first two classes should be called up and made ready to serve as the means of explaining the

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new form. Frequently, the development of an aim or purpose is sufficient to bring to mind the related ideas which are needed.

The teaching of the new lesson

a. The presence of a motive serves to guide and to limit the observations and the activities in the step of presentation. An object lesson in geography without a clear aim is a desultory proceeding, and frequently results in much disorder and little knowledge. The aims in any one lesson should be few and distinct, and the attention of the class should be held closely to observing the facts which relate to them. Other questions may come up, but they should be reserved for other lessons or else deferred until the particular aims of the lesson in hand have been covered.

It will help pupils to keep to the point if they write in their notebooks the questions or topics they are to consider, and then, as important parts are brought out in the lesson, they should write these in order under the proper question or topic. Sometimes, when attention lags or wanders, the teacher needs to call it back by asking, "What are we trying to find out just now?" or some similar question. The pupils will learn presently to criticize those who stray from the subject at hand.

b. Too much study of detail defeats the purpose of the lesson. Excessive study, even of the concrete, in one class period results in hazy and confused impres-

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sions. The observations should be limited to comparatively few facts and these should be well mastered.

c. Some pupils who are less shy than others frequently monopolize much of the time given to an object lesson, while the timid ones hesitate to ask questions which they would like to have answered, or to place themselves in a position where they can see well the facts to be observed. Unless the teacher takes cognizance of this condition, part of the class will fail to reap much benefit from the lesson. The opportunities for observation and questioning should be distributed for the benefit of the entire class.

d. Excursions and other similar lessons often afford occasions for study by the class and for individual study as well. Certain phases of the lesson are observed by all pupils, while individuals or groups have special assignments to work up and report upon. In an excursion, this necessitates calling the class together from time to time for the study of some points, and then permitting the pupils to work on their individual problems. It requires the determination beforehand of meeting-places, and of signals to call the class together. It means, also, that the pupils must understand clearly that the excursion is not a mere pleasure outing, but that it is a lesson which requires obedience, careful work, and responsibility for results.

e. When the observations have been made, the pupils should be held accountable for the lesson. The question or questions with which the lesson started

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should be answered. Individual and class study should be recited upon in the following lesson period. A satisfactory account of what has been seen or done should be given either in oral or written form, and the main points should be made prominent.

Planning the object lesson

The object lesson requires careful planning on the part of the teacher. If a geography class is to have an outdoor lesson, the teacher should inspect the place beforehand, decide upon the points to be studied, the best places for observation, the route to be traversed, and similar details. If it is an experimental lesson in physics or chemistry, materials and apparatus should be prepared, and the experiment should be rehearsed by the teacher to be sure that everything is in working order. Many a lesson has been interrupted at a critical point because the instructor forgot some piece of apparatus, or failed to find out beforehand that the apparatus or materials were not in working order. If the lesson is the usual exercise in the classroom, the teacher should be foresighted and prepare for it so that when the day arrives for the lesson the materials may be at hand and ready for use.

Providing illustrative material

The matter of providing illustrative material for nature lessons has not impressed some teachers seriously. Very recently the writer has seen a teacher

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trying to give a lesson on clams with only a part of a clam shell to illustrate the work. This was in a neighborhood where clams may be obtained readily. Another was teaching about snails with no objects present at all, despite the facts that only a few blocks away there was a pond where plenty of snails could be found, and that the pupils would have been very glad to collect some for the lesson. A lesson on the canary bird consisted in a desultory talk about the bird, which arrived nowhere in particular. No bird was in evidence, although a question revealed the fact that in several of the homes represented canaries were kept as pets, and that the pupils could and would bring the birds to school if they were wanted. Such lessons as these just cited are not really nature lessons. To fulfill their purpose, *there should be enough material at hand for every pupil to see the facts.* In many cases this will mean a specimen for every member of the class. Sometimes it will mean but one object for the entire class. To study the fly, spider, or mosquito with only one specimen for a class of fifty pupils does not meet the purpose. On the other hand, one bird, one goldfish, or one stalk of corn might suffice for a class.

In some cases the pupils should provide the material for study, and this for several reasons. It encourages the collecting instinct, and it connects the school activities with the outside world. Furthermore, in obtaining the material the pupils frequently learn much about the specimens which they would have missed other-

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wise. The children who look for mosquito larvæ discover some facts which are well worth knowing; and the boy who secures a full-grown dandelion plant with its entire root finds at least one good reason why the plant is so hard to exterminate.

A word of caution, however, is necessary in regard to encouraging pupils to obtain materials for school purposes. Fine shade trees, the wild birds and flowers, and private property should all be respected. Pupils must be taught to bear this fact in mind. If wild flowers are gathered, the roots should be spared for future flowering. Sentiment and good sense can be brought to bear in regard to what to select and how to treat it.

Another suggestion about nature study is that the course of study should be so arranged that the objects may be studied in their most favorable season. This ought to be self-evident but experience shows that it is not so. The mosquito in January and seed-dispersal in February are typical of assignments of topics which teachers have been known to prepare. If pets are to be brought to school, they should be studied when the weather is not so cold as to make their visit to the classroom dangerous. Spring flowers should be assigned to the months when they bloom, and insect life should be observed when the weather makes it possible to obtain specimens. Material obtainable at any season may well be given in those months during which excursions are impossible, and plant and animal life are difficult to observe.

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Summary. (1) The object lesson consists of the study of material, activities, or conditions at first hand. (2) It may form a part of the inductive lesson, and in any case requires motivation and the use of an apperceiving basis. (3) The observation should be closely limited to the facts which bear upon the problem and all pupils should observe these facts. Some pupils may have special tasks assigned to them. (4) The class should be held responsible for the results of the lesson. (5) The object lesson requires careful preparation on the part of the teacher. (6) There should be enough illustrative material for all pupils to observe the facts to be taught. (7) This material may be collected by teacher or class according to circumstances. (8) Plant and animal forms and other natural phenomena should be studied in their most favorable season.

REFERENCES: W. W. Bagley, *The Educative Process*, chap. XVI; G. D. Strayer, *A Brief Course in the Teaching Process*, chap. V.

EXERCISES

1. Show how the study of the apple blossom may form a part of an inductive lesson. Of a deductive lesson.
2. Make a list of ten objects or processes which may be studied through object lessons. After each one write the motive which you might arouse in the minds of your class for its study.
3. In any object lesson, what facts would you omit?
4. What objection is there to permitting a very bright pupil to do most of the reciting in this type of lesson?
5. In the study of interesting material, pupils tend to wander far from the aim. Suggest ways of preventing wandering without dampening enthusiasm.
6. Which would you consider the better object lesson, — one in which fifty details had been observed or one in which ten had been considered? Upon what do you base your judgment?
7. Suggest ways of obtaining enough material for the object lesson on the spider.
8. Can the study of the picture of a spider be classed as an object lesson! Why, or why not?
9. Should pictures be used when objects can be obtained?

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10. Pupils in a certain city were directed to bring specimens of tree branches and leaves to class. They spoiled all the young trees in the neighborhood of the school in obeying the order. How may such damage be avoided and material still be obtained?
11. What advantage has the study of objects and processes directly over learning about them in any other way?
12. Select some manufacturing plant or other place of industry in your neighborhood, tell what you would expect the entire class to observe during a visit, and designate what you would assign to individual pupils for study.

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VIII

THE ASSIGNMENT OF LESSONS

The purpose of the assignment

THE lesson assignment is that form of teaching which prepares pupils for work outside of the class period, or when lessons must be prepared without the teacher's direct assistance. It may be that the lessons are to be studied at school, or worked up at home or in the library, or somewhere else outside of the classroom. Wherever they are prepared, the pupils are supposed to be following directions imparted to them in some assignment exercise. This assignment must indicate the work to be done, and frequently, one might say, usually, should take account of the special difficulties to be met and the best means of studying the particular lesson assigned.

Kinds of lessons which may involve assignment

The assignment is sometimes treated in lectures and textbooks as if it prepared for textbook study only. This is too narrow a view to take of the exercise. It prepares for any work to be done by the pupils independently; that is, without the teacher at hand to supervise and direct every step taken. The task assigned may be the acquiring of knowledge from some source,

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whether from books, people, observation, or reflection. It may be the collection of materials for an object lesson. It may be the application of principles, as in geometry, arithmetic, or grammar. It may be a private drill exercise in spelling, multiplication tables, penmanship, oral reading, music, or sewing, or some other subject which requires practice to insure skill. It may be the performing of certain exercises to correct physical defects or to assist physical development, as bending, stretching, and drawing deep breaths. Any teaching which involves work outside of the class period must evidently require an assignment; hence to limit the discussion to textbook lessons is to treat the subject too narrowly. The assignment may be a part of an inductive or deductive exercise, an object lesson, a drill lesson, a review lesson, or any form of class exercise which conforms to the conditions above stated.

When the assignment should be made

If the work to be prepared by the class grows out of, and depends upon, the preceding class exercise or lesson, then the assignment may properly and profitably be made at the close of that lesson. If, however, the work is not dependent upon that lesson, the assignment may be made either at the beginning or at the end. The new exercise in literature may not depend upon the one which immediately precedes it; consequently, the teacher may choose whether to assign the following lesson before the recitation on the one

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at hand, or to complete the latter and then devote the necessary time to assigning the new exercise. The danger of delay is that the time often passes more rapidly than the teacher is aware, and the assignment is therefore too meager and indefinite for the good of the class.

It frequently happens that the questions which constitute the problems to be solved in the new lesson are raised during the course of some lesson a day or more in advance of the period when the subject is to be discussed in class. When not too remote from the day of recitation, it is worth while to make the assignment when the questions are raised, even if it interrupt the lesson for a few minutes. The motive is in the proper setting then, and the new lesson will be all the better prepared on that account. If the assignment keeps thus cropping out during the course of an exercise or several exercises, there should be a definite restatement of it as a whole before the study period, so that all pupils may know just what they are to do and how they are to do it.

One cannot make a hard-and-fast rule about the time of the assignment, since it depends upon conditions which vary. However, the teacher should choose the time thoughtfully and not leave it to the mercy of chance or habit.

What the assignment should do specifically for the class in regard to subject-matter

As the assignment may be involved in any form of teaching exercises which require independent efforts to

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extend knowledge, — such as the inductive lesson, and the deductive lesson, — it partakes of their technique. Certain features of these types of teaching are features, also, of the assignment. It must bring to consciousness the problems to be solved, and the conditions to be met in the period of independent work. If it should fail to do so, the preparation by the pupil will consist probably of memorizing the text or of indefinite work in other directions. Undirected effort is random effort, and without an aim or motive such effort is the only kind the pupil is likely to expend. It may be that the assignment involves observation, experimentation, reading, talking with others, or reflecting upon a situation and working out a chain of reasoning, either inductively or deductively. It may involve the steps of comparison and generalization, or it may demand the application of rules and principles. Whatever the effort involved may be, the motive which is to call it forth must be made clear in the assignment. The assignment may thus at times coincide with the step of preparation, since it includes the raising of a question or problem, and when necessary the recall of the ideas upon which the understanding of the knowledge to be gained by the pupils must rest. Thus, in assigning an advance lesson in geometry, the teacher not only leads the class to see clearly what is to be done, but helps the students to see what part of their previous knowledge bears upon the solution. Seeing the question plainly and knowing where

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help lies, the pupils are prepared for independent work.

A teacher of mathematics in one of our best-known normal schools taught geometry for many years with marked success without using a textbook in class. Textbooks were absolutely forbidden, as were the notebooks of previous classes and all other helps. The assignments were models of definiteness. The problems were stated so that no one could fail to know what he was to do. Then the axioms and previous demonstrations which seemed to bear upon the new problem were recalled and scanned with critical mind to see if they offered the necessary basis. When the class was on the right track, the assignment ended.

Many pupils fail in preparation largely because these two features of the assignment are not observed fully; namely, defining clearly the thing to be done, and recalling the old ideas which explain the new.

It sometimes is the case that the subject-matter assigned for study from books contains technical difficulties in the form of new words used in an unusual way or of difficult grammatical constructions; or the difficulty may lie in the obscurity of the author's meaning. A young pupil who, in preparing a reading lesson, must struggle with the pronunciation and meaning of a number of words is greatly handicapped. These difficulties should be anticipated in the assignment and the path made clear. Even older pupils who are reading such classics as *Merchant of Venice* or *Lady*

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of the Lake will need the same kind of assistance. Those who have tried to teach literature, mathematics, or grammar to pupils in the higher grades of the elementary schools, or in the high schools, are well aware that even a little variation from the sentence constructions to which pupils are accustomed is sufficient to keep them from getting the meaning. Only recently a young girl read the line, "The muster place be Lanrick Mead," as "The mustard place be, Lanrick, Mead." A new word and a slight variation in form were too much for her to comprehend. Those who teach foreign languages find it particularly necessary, in the assignment of a new lesson, to call attention to the new or rare forms of words or sentences so that there may be understanding without the expenditure of too much time. The pupils are to do a certain amount of work within certain time limits. They need enough assistance in the assignment to enable them to meet these conditions with good, faithful effort on their part.

How the assignment should help with methods of study

In their efforts to keep their pupils from simply memorizing a textbook lesson, teachers sometimes tell them to prepare to give the thought in their own words. Sometimes they go a step farther and give a list of questions the answers to which the pupils are to find during their study period. A still more advanced stage of procedure is the preparation of a topical outline by

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the teacher upon which the pupils are to recite after they have studied the lesson. When the pupils have had practice in independent work, the assignment may include directions for them to prepare a list of questions covered by the lesson they are to study, said questions to be brought to class to be answered by classmates; or, they may be required to prepare their own topical outline according to which they will make their recitation. Such assignments prevent or break up the habit of memorizing the text and compel the selection and arrangement of the most important points studied.

Need of indicating sources of data in the assignment

In some study periods, the pupils must find data from other sources than the textbook. A lesson assigned to a primary class in New York City involved finding out where the parks of that city are and what these parks offer that is instructive and entertaining. "Where will you go to find out?" asked the teacher. After thinking about the question, the children concluded they could find out from the wall map where the parks are, and could ask at home about the answer to the other question. Similarly, in an eighth grade, the pupils who were going to make an independent study of the continent of Africa reflected about sources for a time and decided upon certain atlases, textbooks, books of travel, and other sources. The teacher then added to the list of references. The result of such pro-

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cedure is that the pupils can go to work at once without losing time in deciding about sources, and that they will be likely to use the best sources since they help one another by their suggestions during the assignment, and the teacher has an opportunity to correct and supplement their list.

Class and individual assignments

The two assignments just cited contained another feature which it is often advisable to employ. There were too many parks for all to study, so different parks were assigned to individual pupils for investigation. A similar arrangement was made in the assignment of work about Africa. Certain reference books and certain topics were assigned to groups of pupils who were to make their topical outlines and report. Such assignments give worth and interest to the work of individual pupils or groups and usually result in greater effort, since the class is to learn some definite fact or facts through the reports made. Furthermore, in this way, more ground can be covered than when every pupil is required to study every fact for himself. We live in an age of investigation and of committees, and we may well utilize the plan in school, profit by it in our work, and give the pupils training in its employment. Of course, there will usually be some parts of the lesson which must be studied by all pupils in the class, and at times all pupils must study the entire assignment.

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Page assignments

It need hardly be said that such assignments as have been here discussed are very different from the assignment of a certain number of pages with no accompanying suggestions. When a page assignment, or the designation of a certain amount of ground in a book to be prepared, means nothing more than memorizing, or trying to say the lesson in one's own words, it is inadequate. When pupils know how to study as they should independently, then it is not out of place to make such assignments. Students then know what to do with them and should be required to make the right kind of preparation.

The assignment book and clear assignments

It is the frequent experience of principals of schools that parents complain of the indefinite assignments of home work or the lack of any assignment. Children say they have nothing to do, or else that they did not understand what was to be done. It is doubtless true that these statements are sometimes mere fabrications; on the other hand, they are frequently justified. Sometimes the assignment lacks clearness or is made so hastily that the pupils fail to grasp it. Then, too, pupils forget by the time the study period arrives what is to be done, and also the details of their task. To avoid all these conditions, assignment books are advisable. In these may be written the ground to be covered, the suggestions as to method, and the other

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facts necessary to the successful preparation of the lesson.

These books should be written up at the time of the assignment, and two or three pupils should be asked to read what they have written. This will insure definiteness, and it leaves no excuse for the pupil who is inclined to shirk by pleading ignorance of what is to be done. The use of such a book reflects itself in the teacher's method of giving out lessons. She must take time for a full assignment, arrange it carefully, and word it clearly. This is good both for teacher and class.

Effect of proper assignment upon interest and effort of pupils

A great advantage of the assignment which sends the pupils to their study with a motive or problem is that it affects the attitude of the class toward the lesson. There is an opportunity to arouse interest in the subject and a genuine desire to perform the work for the sake of the results it will bring, — not in percentages and class standing, but in knowledge and skill. The pupils who begin the study of Japan with the idea of finding out how it was able to defeat a great nation like Russia; or who attempt to discover why a handful of English along the Atlantic coast of North America were able to wrest supremacy in the continent from a great military power like France; or who go to their work with the questions, What need does the State have of money? and, How does it provide its funds? —

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are much more likely to be interested and to expend effort than if no such motives for work are brought before them. If these questions are asked by pupils, which is quite possible, they must of necessity grow out of some class discussion or the consideration of some facts which have aroused curiosity, — a prolific source of problems and a guaranty of interest. With the question raised, there is the possibility of having suggestions as to causes. These suggestions, or hypotheses, constitute part of the assignment, as they must be investigated to see whether they are true and whether they solve the problem.

The effect of studying because of motive and interest has been expressed by the eighth-grade boy, whose teacher conducted her school on this plan, who said, "I never worked so hard before in my life, and I never had so good a time as this year"; and by a teacher who said "This plan of having the pupils study for a purpose takes the *grouch* out of school work." If a teacher will try, even though clumsily, to raise questions or to bring up a situation which causes the pupils to ask questions, he will be surprised at the immediate effect upon the class. Interest and activity are at once apparent and are manifested by the entire class, almost without exception. This has been demonstrated so often, even in classes conducted by inexperienced teachers, that it seems inexcusable to neglect so ready a means of securing a favorable attitude toward school work.

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Summary. (1) The purpose of the lesson assignment is to prepare pupils for the independent study of a lesson. (2) The assignment may occur in connection with any lesson which requires such study. (3) It may be made during any part of a class period, being determined at times by its relation to the preceding recitations. (4) It should develop or bring to mind the end to be accomplished, whether increase of knowledge, skill, or physical well-being; and should prepare for the obstacles to be met. (5) It should, when necessary, bring to mind the method of working, and determine sources of material. (6) It may consist of class or individual assignments, or both. (7) The assignment of a lesson in the mere form of amount to be done, should not be employed until pupils have learned to study as they should without further direction. (8) The use of an assignment book is helpful for immature pupils. (9) The interest of pupils, the right emotional attitude toward the lesson to be studied should be aroused.

REFERENCES: T. H. Briggs and L. D. Coffman, *Reading in Public Schools*, chap. XXV; W. C. Bagley, *The Educative Process*, chap. XXI; L. B. Earhart, *Teaching Children to Study*, chap. VIII.

EXERCISES

1. A teacher once assigned this lesson to a fifth-grade class in geography. "For to-morrow, find out at home all about the exports and imports of the United States." Criticize the assignment.
2. In your own experience as a pupil, did the lesson assignments err on the side of doing too much for pupils or of not doing enough to enable them to prepare the new lesson as they should?
3. When does an assignment do too much?
4. When does it not do enough?
5. Plan an assignment for a drill lesson in spelling.
6. Indicate an assignment in connection with a deductive lesson in interest, that is, a lesson in which the rules are already known.
7. When may an assignment be made at the beginning of a lesson period? When must it be made at the close of a period? Give an instance of its occurence during a lesson.

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8. Criticize such an assignment as, "Take the next four paragraphs." Is such an assignment ever justified. Explain.
9. Explain what you think a good assignment should include.
10. How much should a teacher consider in the assignment of a new lesson the attitude of the class toward the lesson? What relation is there between attitude and lesson preparation?
11. What would you expect pupils to do ultimately in the way of planning their own lesson assignments.
12. What advantages are there in assigning special work to certain individuals which they will later report upon to the class? Should such assignments be made to the very bright or the very slow pupils? Justify your answer.

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IX

THE RECITATION EXERCISE

What the recitation is

THAT type of teaching exercise in which the pupils report the results of their study and investigations is called the recitation. The subject-matter thus given may receive further treatment during the class exercise, but the basic feature of the lesson period is the rendering of prepared work in some form by the pupils.

What material may constitute its subject-matter

As the subject-matter which is assigned to pupils and studied by them for the purpose of increasing knowledge covers a wide range of material, we may expect the recitation to cover an equally wide range. The pupils may report upon as many kinds of material as can be assigned or studied in order to discover facts about them. Tasks assigned for the sake of increasing skill or forming habits would not form the basis of a recitation lesson, since they have not for their aim the learning of new facts. They are drill exercises. Thus, pupils may recite upon a lesson from a textbook or reference book of some kind. This is a very common class exercise. They may give the results of observations or experiments which have been made in the study period.

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Such recitations should frequently accompany the work in science, in geography, and in nature study, and should also be a part of the art study which sets pupils to looking for the artistic features in their surroundings. The information gained by inquiries made among people outside of school is a contribution to the recitation lesson. The children of immigrants, who question at home about living conditions in the countries from which their parents came, often have valuable material to bring to class; as have also the pupils who inquire about the nature of business transactions. From many sources, whether people, books, papers, periodicals, or the pupils' own experiences and observations, information may be obtained which bears upon the problem raised in the assignment, and which may be brought to class for use there.

Forms of the recitation lesson

a. Verbatim reproduction of matter read. Pupils who lack training in the better forms of recitation work usually try to give the results of the study of a lesson from a book in *verbatim* forms. They know no other way. It has been the writer's frequent experience with classes of adults, that many teachers who have taught for several years are lacking practice and skill in any other form of recitation than giving the book word for word, and are helpless and distrustful of their own ability when urged to try a different method. They will admit that a reproduction of words in a sequence

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does not guarantee understanding, but understanding may not have been required when they learned the habit of *verbatim* reproduction. They in their turn are not making sure that their pupils have gained in thought when they permit or require them to recite the text in this way and let the lesson end with it. If books contained *all* that the pupil should learn of a subject, if they were correct in statement beyond all doubt, and if the act of memorizing were at the same time the process of understanding, then rote recitations might be accepted as satisfying the needs of a given situation. But since these conditions do not exist, then some other form of reporting work should be adopted.

b. Unorganized account of reading, observation, experiment, or other investigation. It is an improvement upon the type of recitation just discussed to have the pupils give the thought in their own words, but if nothing further be done in the period devoted to the exercise, but little of value has resulted to the pupils.

When facts gained from some other source than books or periodicals are reported in class, there is often a lack of coherence and clearness in the pupils' efforts, and to the extent that this is true the reports lack value. There is little or no arrangement of items in orderly sequence, and the ideas in regard to one topic are not grouped together. Pupils rush into their reports at almost any point and give facts in an indis-

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criminate order. Evidently the most helpful recitation should be different from this type.

c. Topical recitation. A good recitation should show some degree of mastery of the material gained, whatever its source. There should be evidence of control of the subject studied. There must, then, be an order in the presentation of results by the pupils to the class. This order is secured by the arrangement of the facts in the form of an outline or synopsis. If a class in history has studied Burgoyne's invasion, the pupils should recite according to an outline of topics which they have prepared during their study. If their problem was to find "How an attempt was made to defeat the colonies by separating them and what came of the attempt," they might take that as their heading and arrange the following list of topics: —

1. The threefold plan to defeat the colonies.
   a. The movement up the Hudson.
   b. The movement down the valley of the Mohawk.
   c. The movement down the Hudson.
2. The fate of the Mohawk valley expedition.
3. Why the British in New York failed in their plan.
4. The difficulties encountered by Burgoyne.
5. The outcome of the plan to conquer the colonies by separating them.

With such an outline in hand, a pupil should be able to stand before the class and give a coherent account of the lesson studied. Thus two good ends are accomplished by the topical recitation; first, pupils learn to sift out the essential facts in a lesson and arrange

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them in a good order for presentation; and, second, they learn to recite independently, clearly, and forcefully. They learn to hold points in mind and to follow them. This is not an ideal too difficult for elementary-school pupils to accomplish, as has been demonstrated by numerous classes of children from the third and fourth grades up. Eighth-grade pupils can prepare outlines and give recitations upon them which are far in advance of what adult classes frequently render. They only require to be given some training in preparing outlines and in making full and clear recitations according to them, and then to be held to this form of work consistently. They will prepare for what they know the teacher will require in class.

d. Question-and-answer recitation. Classes of questions. Teachers frequently resort to questioning in order to bring out in class the results of the pupils' study. Sometimes the whole recitation period consists of a rapid fire of questions of narrow scope, and of answers which are equally limited. "What is the capital of Minnesota?" "In what part of the State is it located?" "On what river is it situated?" "When was it founded?" "By whom?" "What are its industries?" "What is its latitude?" This list of questions is typical of many recitation exercises. Such procedure is time-consuming, fails to bring the subject-matter before the class in connected units, and neglects absolutely the training of pupils in habits of systematic study and recitation. Probably few recitation periods

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will pass without some questions being asked, but these should be radically different from the examples just given.

In preparing for a recitation exercise a teacher needs not only to decide about the subject-matter to be covered, but he needs to plan for the main questions to be asked in case the recitation is to be conducted on the question-and-answer plan. He should determine what are the principal divisions of the subject, and what the corresponding questions are which will require the pupils in answering to cover these sections, a section to a question if possible. Practice in writing out a list of main questions will usually increase skill quickly.

In addition to making the questions cover large rather than minute units of work, the teacher should strive to avoid so wording them that a plain clue to the answer is given; that is, the question should not reveal the answer. The answer is indicated sometimes through being included in the question; as, "It was very wrong of Benedict Arnold to attempt to betray his country, was it not?" It is sometimes indicated by framing the question practically in the words of the book, so that the pupils have a direct clue if they have good verbal memories and can recall what the rest of the sentence in the textbook was. If the answer can be called for in such a way as to require the changing of the book form, a surer mastery results. If the teacher asks, "What are some of the difficulties in obtaining the world's supply of gold?" or "Why is St.

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Paul, Minnesota, an important city?" or "Would St. Paul be a good city to go to for the purpose of engaging in business?" — rote answers become impossible and the thoughtful selection of facts in their proper relation becomes necessary. Usually, it is better not to give a choice of answers through the question, as such questions limit the thought. To ask, "How did the delay in capturing Philadelphia affect the British plans for the campaign of 1777?" requires better effort than to ask, "After the capture of Philadelphia, did the British commander remain there or did he go back to New York?"

Pupils sometimes experience difficulty in answering because they do not understand the question. It is a difficult matter to prepare a list of questions for a class so that all pupils will interpret them as the teacher intends. There is need of inspection to see that they are simple and clear, that they are easy enough for the pupils to understand, and that they lead to the answer the teacher has in mind.

We have been told by some writers that the direct question, the question which can be answered by *yes* or *no*, is to be avoided. As a rule it is not the best type of question, since it often does the work for the class and simply requires a nod or a shake of the head in answer. There are times, however, when a direct question is provocative of good effort. "Is it a good plan for a new administration to make a clean sweep of the office-holders in the civil service?" is a question which may

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result in most fruitful activity on the part of the class. At times a pupil who is attempting to avoid an issue without revealing his ignorance needs to face squarely the question, "Is this thing true or not?" Such a question is one which will arise during the recitation period and does not involve preparation by the teacher.

There are other charactersitics of good questions which are worth striving for. Some of these are as follows: (1) Questions should call up associated facts. (2) They should not be ends in themselves, but should carry the thought forward. (3) They should not be so indefinite as to permit of guesswork. (4) They should be interrogative in form, not declarative in all but the final word. (5) They should bring out the subject-matter in the order of dependence, or logical relationship, if such exists.

The questions should as a rule arouse activity in all the class; hence they should be directed to the entire class rather than to an individual in the class. This plan precludes naming beforehand the pupil who is to answer the question; also asking questions in turn, so that pupils not near to the center of activity can become inattentive.

Two cautions which many teachers need are, first not to repeat a question unless it is quite certain that the class does not understand it; and, second, not to repeat the answer of the pupil. The first may be unnecessary and leads to inattention. The second leads

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to slovenly work on the part of the pupils. Both cause a loss of time.

The amplification and correction of data collected by the pupils. New questions raised. Value of books determined

If the recitation exercise consists solely in giving a topical recitation of the facts gleaned from a common source by all of the class, whether the topics be given by the teacher or prepared by the pupils, or if nothing more is done than to have the pupils state these facts in answer to the teacher's questions, only part of the value of the period is realized. An author's presentation of a subject is often incomplete, and may be, at times, misleading. It may also be inaccurate. One of the most valuable features of the recitation should be the discussion of the reports made by the pupils in order to add to the statements of the text, to correct misconceptions, and to follow out trains of thought suggested. In addition to the topical outlines which they bring to class, pupils should bring lists of questions suggested by the presentation in the book but left unanswered. Excellent work of this kind was done for the writer by a fourth grade in a series of reading experiments conducted in the Speyer School. Higher grades should do even better work along this line. Pupils who have access to other sources than the textbook can add much to the recitation by bringing in reports of what they found there which bears upon the

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lesson. These reports, it scarcely need be said, should be presented in as good form as the textbook lesson, and may be kept in the class notebooks in which the pupils keep the outlines prepared for class, their lists of questions, the names of references, and other helpful items. The teacher, too, should frequently have supplementary material to offer in the form of books, magazines, clippings, and the like. He may tell it, read it, or have some member of the class read it. He may also have questions to ask which bring forth fruitful discussion by members of the class. The lessons are made rich in content and interest by these means, and lose their perfunctory character. There is actual remaking of experience in such exercises. Ideas are increased in number and broadened in meaning. Pupils are more interested because they are dealing with problems and because they are bringing individual work to the class in addition to that which all have prepared. Such a recitation is a clearing house of ideas. Pupils bring their own contributions and receive from others.

In addition to supplementing the text, the recitation period should clear up errors. The child who read that "The Pilgrims sought an asylum in Holland" and recited, "The Pilgrims went to an asylum in Holland," needed to have his idea investigated and, as it turned out, corrected as well. This instance represents a class of errors due to the authors' way of expressing their thoughts. The words are not al-

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ways understood, nor are the sentences clear, hence even experienced readers sometimes differ in their interpretations of an author's meaning. Pupils with less experience are frequently puzzled and misled. The author who writes for fifth-grade pupils that "The Norwegians are famous for their tenacity of will," writes over the heads of his readers. Even so simple a statement as the one that "The mountains of Japan are too near the coast to admit of long rivers" causes misunderstanding, since with school children *admit* means *to allow to enter*. If pupils are encouraged to report their difficulties in class, they will bring up such passages as have puzzled them and which they must have explained in order to understand some point that is valuable. Other members of the class, or, as a last resort, the teacher, may be able to give the help needed. If the error is revealed through the recitation, assistance can be given through these same channels.

In gleaning material from many sources, pupils may find statements which are absolutely false or of very dubious character.

Reading must be carefully done, observations must be exactly taken, and things heard must be sifted before reports are made. Gradually, as more responsibility is put upon pupils for the selection of the sources of data, the children ought to become capable of discriminating in their judgment of these sources. They should consider why one newspaper should be consulted rather than another; why one historian or geographer should be preferred to others; and why certain people's reports are more to be relied upon

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than others. . . . Criticism of sources will often come naturally, as for example, the criticism of newspapers and periodicals of the sensational type; of writers whose statements are founded on slight evidences and permeated by an unfriendly spirit.

Through partisan spirit, through conscious intent to deceive, or through lack of reliable data, historians may write statements which should properly be questioned. Because of the frequent changes in boundaries and forms of government, geographies quickly become inaccurate. These are but typical cases which show the need of keeping a questioning attitude toward an author's statements. The recitation period offers one opportunity for this careful scanning of facts. It should encourage the comparison of statements drawn from different sources to see whether they agree, and to determine why one statement or account should be accepted rather than another. The results, both in knowledge and in the habit of mind formed, thoroughly justify such procedure.

How the notebooks may be made helpful

The subject of notebooks has already been referred to. If the pupils made no other use of them than to write a list of paragraph headings or a topical outline from the matter found in the class textbook, it would be worth while to employ them. Add to this the synopsis of material found in other places, the questions which come up during the study of the lesson, the

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difficulties encountered, the names of helpful references, the reports of experiments or observations or investigations, and the like, and the notebook becomes invaluable. It is very different from the book in which the pupil writes only that which the teacher dictates, or writes on the blackboard for him to copy. It is the fruit of his own effort. It contains his contributions to the classwork. It helps him keep track of his difficulties as well as of important data and sources of data. One need only compare the preparation of such a book with the lesson preparation which consisted in learning the text *verbatim*. The one is mechanical; the other means mastery of thought. We have not yet fully realized how helpful an aid the notebook can be, nor have we utilized it as we should.

Learning to follow the recitation in class

When the recitation period is devoted to the mere reproduction of a selection from a book which all have read, the attention of the pupils is difficult to hold. It is a psychological fact that attention soon wearies with monotony and must have interest or variation of some sort to hold it. If the recitation period is devoted to learning something new about the lesson, if the pupils' individual work is a contribution, if they are learning from the teacher or from the reports brought in by their mates, there will be little difficulty in holding attention. The members of the class will attend in order to learn what the others have to say, in order to

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correct errors, and in order to add their quota to the classwork. If nothing new is said, if the teacher corrects all errors, and if pupils have no opportunity to supplement each other or the text, why should pupils attend or try to follow the recitation? They will follow if their interest is aroused and if they are made active participants in the exercise. There will, of course, be shirks, and these will have to be held closely responsible for results at times in order to keep them at work. Usually, the matter of securing attention takes care of itself when the recitation is live and worth while.

Summary. (1) The recitation is the class exercise in which the pupils report the results of their study. It deals with subject-matter rather than drill exercises. (2) The material studied may be obtained from books, periodicals, or newspapers. It may be something observed or experimented with. It may be information gained through inquiries made in one's social group. It may be the results of one's own mental processes. (3) The forms recitation may take are the *verbatim* report, a paraphrase of the text, the topical exercise, and the question-and-answer form. (4) In the recitation, the subject-matter presented should be amplified and corrected. Pupils should learn to weigh the value of statements and sources. (5) In connection with the recitation, the pupils should be required to keep notebooks in which to enter their outlines and summaries, questions to be discussed in class, sources of data, and the like. (6) Pupils should learn to follow the recitation in order to learn, to correct, and to supplement.

REFERENCES: G. H. Betts, *The Recitation;* J. A. H. Keith, *Elementary Education*, chaps. VIII and IX.

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EXERCISES

1. Which do you consider more valuable in results to a class, a recitation lesson in which the pupils recite memorized subject-matter with little or no prompting, or a lesson in which the teacher asks many questions the answers to which are taken bodily from the textbook?
2. Suggest a better form of recitation than either of those described in the preceding exercise.
3. "Indeed, Washington had already shown his patriotism in many acts of statesmanship. There had been a time, just at the close of the war, when the officers of his army, disgusted with the government, suggested that Washington be made King. Had he accepted this suggestion it is very likely that our country would have been doomed to a military government. But the noble character of Washington resented the idea and he convinced his officers that they were wrong. And now once more he was to lead his countrymen in the paths of peace. When the convention came together Washington was promptly chosen its chairman."
   (*a*) Write a list of questions covering the material in the above paragraph which can be answered from the text.
   (*b*) Suggest the best possible treatment for this paragraph in a recitation lesson.
   (*c*) In what respects do you consider (*b*) better than (*a*)?
4. Suppose the following paragraph had been assigned to a class for study. What are some of the questions the pupils should bring to the recitation lesson for answer?

   "Under the new Constitution certain officers were to be elected. Able men were chosen as members of Congress. For President there could be but one choice. All looked to Washington to guide the new nation, and he was elected without any opposition whatever. For Vice-President, John Adams, of Massachusetts, was chosen."
5. How many of the questions prepared in the preceding exercise might the pupils answer for themselves so that they could present both questions and answers during the recitation period?
6. What value is there in having pupils present the results of their study according to an orderly plan?
7. In the recitation period what responsibilities should be borne by the class? What by the teacher? Is this the usual way of dividing them?

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8. In order that a recitation may be as profitable as possible, what preparation should a teacher make for it?
9. Teachers are frequently judged by the way they conduct a single recitation. What in a recitation would justify you in concluding that a teacher possesses good professional ability? That the teacher is doing poor work?
10. Why are recitations sometimes dull and uninteresting? How can the situation be changed?

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X

THE AROUSAL AND GUIDANCE OF APPRECIATION

The reason for this type of lesson

EDUCATION deals with more than the gaining of ideas through the various senses, and with more than logical thinking. It is not limited to the formation of habits or to the establishment of physical health. In the general scheme to produce results through education, we must take all of these aims into consideration, and must include in addition the pleasures, approvals, disapprovals, appreciations of beauty, fitness, and harmony, and the moral and social sentiments of our pupils. If we wish the rising generation to care for good music, pictures, and literature; to be tasteful in personal, household, and municipal decoration; to dislike the ugly, the untidy, the unclean, and the unfitting; and to rise to high standards of living, both private and civic, — we must definitely include training for these ends in our school plans and procedure.

It may be urged that all these ends are accomplished by the lessons which impart information in regard to these various lines of knowledge and endeavor: but knowledge does not always include the feeling of appreciation which affects ideals. There is a value in facts over and above their intellectual value as facts. There

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is the appeal to interest, to emotion, to a sense of appreciation of deeper or finer significances than appear at first sight. The lesson or part of a lesson which is devoted to influencing such interest or appreciation may be called an exercise in appreciation.

The kinds of appreciation to be considered

a. Social. One important type of appreciation is that which has for its basis the values and needs of human beings whether regarded as individuals or as a society. A visitor to a foreign country who remains but a short time is likely to see only the superficial side of life, and because customs differ from those prevailing in his own land, he is inclined to be critical. A longer stay, a more intimate acquaintance gives deeper insight, and a resulting appreciation of ideals and customs which quite alters the first feeling of disapproval. We have here an instance of *social* appreciation.

In those subjects of the curriculum which deal with human life, this social appreciation may be exercised. In geography, history, and literature we ought not to fail to cultivate it on the basis of lofty motives, persistent effort, hardships overcome, and suffering nobly borne. The newspapers of the day are full of accounts of men and women, — yes, and children, — who in some way are serving their fellowmen, often at the cost of much inconvenience or suffering to themselves. The splendid results are worthy of admiration,

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but it is a valuable part of education to arouse the appreciation for that which made the results possible, namely, the spirit and the labor of human beings.

b. Æsthetic. In addition to the appreciations and interests which are based upon human conduct and relations, there is the whole field of pleasures and recreations in which standards need cultivation. The appreciations involved in lessons dealing with these phases of experience are known as the æsthetic appreciations. We need such appreciation in dealing with music, art, literature, or other material in which good taste, beauty, lofty conception, and the like are involved. Since good taste, beauty, and other æsthetic elements are found in many forms, appreciation has many objects upon which it may be exercised. It does not require something difficult, expensive, or far away. It may be aroused in any environment, and by the work of either man or nature. Our greatest need is to learn to open our eyes and see the possibilities of æsthetic appreciation all about us.

In what worth may consist

Few of us have had much training in appreciation in any line in which it is possible; hence we are timid about undertaking to train our pupils. The very word *æsthetic* is foreign to our tongues, and we feel that the things for which it stands are beyond our endeavor, to say nothing of the limited understanding of our pupils. Every teacher who attempts to influence the finer feel-

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ings of his pupils should ask the question, "In what does the worth which is to be appreciated consist?" Professor Charters's [1] definition of subject-matter may serve to throw light on this point: —

> Subject-matter as a way of acting may thus be analyzed so as to be called a way of thinking, of feeling, and of acting with the body. And this helps to make the idea clearer because it is easy to see that geography is a way of thinking about the earth's surface. "Crossing the Bar" is a way of feeling and thinking about death. The Ten Commandments are ways of governing our moral actions. Social customs are methods of acting toward other people, of feeling toward them or of thinking about them.

If in literature or art or whatever we are teaching, we try to find out *how* the author or artist thinks about his subject, and then consider the *way* in which he has expressed his thought, the worth, or sometimes the lack of worth, appears. Thus worth may lie in the thought, or in the form of expression.

In such a book as *Silas Marner* we follow the author's thought from step to step of the story to see how she develops the various characters, and to see what value she places upon such influences as religion, adversity, love of gold, and the unfeigned love of a little child in moulding human life. We discover, also, that the author planned the story with such skill that events seem to occur in a natural manner, and nothing takes place for which we have not been prepared. In the case of the man who was drowned, the situation was so

[1] W. W. Charters, *Methods of Teaching*, ed. of 1912, p. 34.

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presented that it seemed almost inevitable that he should meet such a fate. The author did not have to stop at a critical moment in the story to explain that there was a body of water in a certain locality and that the man was dissipated in his habits. The narrative is so skillfully developed that we accept the outcome without great surprise because it seems so natural. It is clear that in such a piece of literature we may appreciate both the story and the way in which it is told. We may do the same in music; that is, we may make either the author's sentiment or the tones through which the sentiment reaches us the object of approval or disapproval.

Material sometimes has æsthetic value merely because it is pleasing and not because it bodies forth some lofty conception; for example, the well-known picture of the boy blowing bubbles. Much of the reading matter placed before pupils is of this nature. Sometimes the worth to be valued is something ludicrous or humorous. Such worth is found in *Alice in Wonderland*, *Midsummer Night's Dream*, and other masterpieces. Some of our music is of this nature. Appreciation of humor is not to be despised, and if one reflects upon the kinds of humor which many people enjoy, — minstrel-show humor, musical-comedy humor, moving-picture-show humor, practical-joke humor, and newspaper-picture humor, — he will admit that there is need of elevating the standard.

To sum up briefly the forms of worth which it is

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possible to bring before the attention of pupils under ordinary conditions, it may be said that in literature, music, or art, the value may lie in the thought or feeling of the author, composer, or artist, in the form in which he has expressed it, or in both. The ideas may be noble, simply pleasing, or humorous, or may possess some other worthy quality. The skill in expression may lie in either the boldness or delicacy of style; in grandeur or in simplicity; in subtleness or in directness; or it may take some other form.

In nature, we admire form, as in clouds, leaves, crystals; colors, as in sunsets and autumn landscapes; massiveness, ruggedness, strength, as in mountains, rocks, and trees. Sometimes placidity appeals, as in landscapes and still waters. Again, it is variety which appeals, and sameness which bores.

In regard to people, we may learn to value the quality of their motives and ideas, or the quality of their acts; and as we appreciate, we approve or disapprove; sympathize with, or condemn; or are stirred by some other feeling.

A complete presentation of the subject here discussed in fragmentary form is out of the question. If a teacher will study the material he must present, and also that which he *may* present, he will find much that is worthy of consideration from the point of view of the effect it may produce upon the feelings and interests, the estimate of worth, the appreciation of the pupils. If he does not himself see these possibilities, he is not

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likely to produce much emotional effect upon his pupils because so much of their approval hinges upon that felt by the teacher.

Some suggestions as to how appreciation may be aroused or influenced

To show what pupils may be led to see and appreciate in a masterpiece, extracts from a lesson given in a grammar grade are hereby presented. The pupils had sent a letter to an art dealer, ordering some pictures for class study. These had just arrived when the class was visited, and among them were several copies of "The Gleaners," by Millet.

Each pupil was provided with a picture and after quiet examination of it, the class study began.

"What kind of people did Millet enjoy?" "What class did he picture?" *Ans.* "Peasants." "Why?" *First pupil:* "He was never among the better class." *Second pupil:* "It was hard for him to paint other pictures." These statements were challenged by others, and the statement was finally accepted that the artist was more interested in these people than in others and that he painted them for that reason.

"The world has said that this artist's pictures are among the greatest painted. Why should we study them?" *Ans.* "To find out why they are so great."

The teacher then gave the title, "The Gleaners," and explained the old Biblical law and custom. Several pupils remembered that Ruth gleaned the fields.

"Is there anything to indicate the time of day?" *Ans.* "The sun." "The short shadows." "It must be near noontime."

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"How much of the field do you see?" The idea was brought out that broad views such as the one portrayed in this picture are often seen in Normandy, and that the artist could probably see just such a scene as this from his window.

"What is the most prominent feature of the picture?" *Ans.* "Three women."

"Are all of the same age?" *Ans.* "No."

"What makes you think they are not?" *First pupil:* "The one to the left is youngest. Her back is straightest and she is the most graceful."

"Note the dress of these women." Pupils stated that they are dressed alike; that the clothes are very plain; that kerchiefs are worn; also peasant shoes and Normandy aprons.

"Which one is without an apron?" *Ans.* "The one on the left."

"The one on the left has a flap over her neck. Why?" *Ans.* "Perhaps she is protecting herself from the sun."

"Which one is the youngest?" *Ans.* "The one on the left."

"What makes you think so?" Pupils summed up all the reasons already given.

"Why are wooden shoes good for the purpose?" *Ans.* "They protect the feet against the stubble, and they do not wear out."

"Are the women dressed appropriately for their work?" *Ans.* "Yes. They are dressed plainly and they wear aprons."

"Do the women seem to belong in the field?" *Ans.* "Yes. It seems as if they came every day."

"Millet said, 'The fitting is the beautiful.' What is there beautiful in this picture?" *Ans.* "He has the right women in the right field."

"Does any one reach to the horizon?" *Ans.* "One does."

"If all three did, what difference would it make?" *Ans.* "It would spoil the view. It would shut it out."

The foreground, middle ground, and background were ex-

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amined to see what the artist had placed in each. The children saw that the women are represented as just ready to move forward, and decided which one will be the first to step ahead. They tried to imagine themselves in the field and they named the sounds they would hear, as rolling wheels, the sound of voices, — men's voices, because the women are too busy to talk, — the orders of the overseer, the sound of rustling grain, and the song of birds.

"Why has the world decided this is a great picture?" *Ans.* "One can imagine one's self there." "There is so much motion in it." "The hands of the women are so natural." "It is so lifelike because it looks as peasants feel." "Not many painted peasants." "Millet painted with meaning."

Throughout this lesson the pupils were entering into the artist's thought and his method of conveying it, and they were also forming a basis for future judgments. The message was worth while, and the artist had expressed it with skill. This the children came to see and to appreciate to some extent. As is frequently the case, they noted some ideas of little value and overlooked some of much greater worth. Further work in the study of masterpieces should exercise a decided influence upon their understanding of art and upon their attitude toward it.

In literature, we frequently limit our efforts to following the thread of the thought, to getting the pronunciation and meanings of words, and to training in oral rendition. Much of the author's skill will remain undiscovered and consequently unappreciated if nothing more than this be done, and much of the power of the pupils to appreciate will remain dormant.

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Consider, for example, a few lines from Bryant's poem, "The New and the Old": —

"New are the leaves on the oaken spray.
New the blades of the silky grass.
Flowers, that were buds but yesterday,
Peep from the ground where'er I pass.

"These gay idlers, the butterflies,
Broke, to-day, from their silken shroud,
These light airs that winnow the skies,
Blow, just born, from a soft, white cloud."

If these stanzas be presented without the title, the following thoughts might be brought out: —

"What would be a good title for this poem?" (Pupils usually say, "Spring," or name some month, as "April," "May," or "June.") The month may be determined by reference to the new oak leaves. It is sometimes necessary to bring out the facts that the author of the poem, William Cullen Bryant, lived in New England, and that the oak leaves in that part of the world burst forth in May, so that if the name of a month is to be chosen as a title, it must be "May." "What is there in the poem to suggest the title chosen?" (The idea that everything is new will finally be given.) "How many things are new?" "How has the poet expressed the newness of the butterflies?" "Of the winds?" "In expressing newness to how many senses has he appealed?" "What senses are omitted?" (Sound will be mentioned.) "What sounds might be included?" "Try to add a stanza that will include spring sounds." "Why call the butterflies idlers?" "Where did they come from?" "How does the poet tell us where they come from?" "Where does he say the winds come from?" "Is he right?" "Note the use of *winnow*." "We use it to mean separating wheat from chaff, the good from the worthless. Could this be what the author meant?" "Consult dictionary for use of word and see if any new significance is added."

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"Follow the objects in the order that the poet saw them. Is the order a good one, i.e., would one see the objects in this sequence?" (Memorize poem if desired.)

"The idea of spring or of newness was the author's theme for these stanzas. What might be written as a contrast?" ("The Old," or "Autumn," will probably be suggested.) "If you were to write the contrasting part, what would you include?" "Bryant wrote some stanzas to show a contrast with these. Would you like to know what he wrote?" The lesson may end here with the class looking forward to the rest of the poem which may be read later, or the pupils may try to write the rest of the poem themselves.

It is more than likely that the pupils will ask some of the questions indicated in the treatment of this poem. If the teacher starts the pupils to looking, they will be quite sure to make discoveries for themselves, to find places which need explanation, and to request that explanations be given.

The pupils might also contrast the author's selection of words and his poetic form of expression with the words and the arrangement they would ordinarily use to express the same thought. "How does the author's way differ from yours?" "Do you like his way?" "Which lines do you like best?" This study of form should follow the study of the thought, but should precede memorizing, as it prepares the way for it.

In taking up the study of "Lines to a Waterfowl" with a class of eighth-grade pupils, the teacher told the pupils that this poem is considered one of the greatest poems on nature ever written. The class at once turned

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to it to discover why it is a great poem. They saw that it is a fine description of a solitary bird flying through the trackless air, and that the thought which comes into the author's mind of the divine power which will protect and guide him through life is noble and beautiful. These two points give the poem value. With some help the pupils discovered that, in addition to what the poet has expressed directly, he has told a number of things by implication. They found out what time of day it was when the bird was seen; what season of the year it was; in what part of the sky the bird was seen; the direction of its flight; and whether Bryant was an old man or a young man when he wrote the poem. His skill in thus imparting facts by implying them and weaving them into the main thought was weighed as an element of worth in the poem.

"Thoughts that are noble and beautiful should be expressed in fitting language. Has the writer of this poem added to its worth by the way he has expressed his ideas?" This question was asked and led to study of the technical aspects. The selection and arrangement of words, phrases, or lines which appealed especially to members of the class received attention in this part of the lesson, and the class passed judgment upon the language, selecting passages they liked best.

In such lessons as the one just described, the appeal to the ear should not be neglected. Mind and eye have been busy with the poem, but it should not be left until it has been read aloud so that its oral beauty may

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be appreciated, because this is one of its greatest charms. Much of the reading material used in the schools has nothing to commend it to the ear. It is supplied either for the purpose of giving young pupils practice in recognizing words, or for the sake of the thought it conveys. Fortunately there is also a store of reading matter that makes its appeal to the sense of hearing and gives pleasure to the listener. The trouble is that some teachers do not discriminate, and try to have their pupils read aloud every word of every selection presented, instead of skipping judiciously the parts ill-adapted to such a purpose.

It is unnecessary to make suggestions for all subjects in the curriculum, but one more lesson will be quoted to show the possibilities of arousing appreciation of historical situations.

A class that was studying the Civil War demanded rather indignantly to know why the people of Great Britain endeavored to break the blockade of the Southern ports in order to send in supplies. Why should they aid the South? Some study led them to see that it was because British manufacturers wanted cotton. The teacher placed this table on the blackboard.

COTTON IMPORTS INTO ENGLAND

Year	From U. S. A. (pounds)	From other countries (pounds)	Price per lb.
1861	1,290,000,000	392,000,000	14¢
1862	920,000,000	597,000,000	28¢
1863	36,000,000	722,000,000	54¢

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Teacher. "With these figures in mind, let us take a walk in Manchester in 1861." The ideas were suggested that mills were running, many people were working, and were making a good living. The teacher gave the information that about one fourth of a million workers were employed in the cotton mills.

Teacher. "Would the quarter of a million workers be the only ones employed?" *Ans.* "No; there must have been shippers, merchants, shopkeepers, sailors, railroad men, truckmen, dressmakers, and others."

Teacher. "With the mills in operation, what would be the condition of business?" *Ans.* "Business would be prosperous and everybody would have employment."

The teacher suggested a walk in Manchester in 1862, and the class compared conditions with those of 1861.

Teacher. "Come to 1863, and note conditions." *Pupils.* "Conditions are much worse. People are out of work." "Goods are expensive." "There is no money to buy clothes." "Business is dull in many lines." "Bills are unpaid because people have no way of earning money."

A glimpse into these conditions answered the question for the pupils as to why people in Great Britain should seek to aid the South during the war, and it mollified their attitude when they learned that it was not merely a case of meddlesome interference.

A person's ideas of taste and of worth are based upon his knowledge to a great extent. The preceding illustrations show this to be true. They are also influenced greatly by his attempts to do the thing himself; hence the suggestion that pupils try to write stanzas to complete the poem, "The Old and the New." In some of the class lessons, the pupils through their own

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activity may grow in the sense of beauty and fitness. Exercises in color combinations for house furnishing, house decorating, for dressmaking, or for applied design may be given by means of paints, crayons, colored papers, dress materials, ribbons, samples of upholstering fabrics, or wall-paper samples. Sometimes good prints can be obtained which show the interior of famous houses. These afford an opportunity to study colors, designs, and arrangement of decorations and furniture. Pupils can then with their own materials arrange and mount what they consider good combinations of color, and can profitably study and criticize the efforts of their fellow pupils. In connection with these lessons, they should observe and criticize the decorations of their homes and of the neighborhood. Possibly a generation thus trained would abolish much of the ugliness which now offends the public eye, and would substitute a more beautiful environment for it.

In music it is possible to train pupils to feel that a certain quality of voice is the best one to express a given sentiment, while another sentiment demands quite a different quality. The tone and rhythm required for a bright spring song can be contrasted with those suited to a song that is stately or solemn. Attention can be called to the variation in quality of voice and rate of movement in the different parts of the same song, according to the sentiment expressed. The attempt to compose music suited to the words helps the growth of appreciation in music, just

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as the attempt to write leads to better appreciation in literature.

The estimate of worth, the feeling of value is greatly affected by the material with which it is fed, so to speak. If we hear colloquial English, we usually speak it. If we hear poor music, that is the kind we sing or play. In order to produce fine musical appreciation we should provide good music as abundantly as possible, — good lullabies, spring songs, harvest hymns, winter songs, folk songs, national hymns from different countries; these are quite accessible and are well worth hearing and singing. Fortunately much good music is not too difficult for school children to learn, so that it is quite possible to put before them for mastery selections which minister to fine pleasure.

Mechanical devices for reproducing music are in general use and are constantly being improved. They should be utilized to acquaint young people with the compositions of the best musical artists and with the world's best singers and players. If a school cannot buy these instruments, it can often rent or borrow them. People of musical ability are often willing to place their services at the disposal of a school on some special occasion. In this way fine voices and the various kinds of instruments can be heard. Church choirs can be induced to render the anthems of a composer in whom pupils are interested. In large cities where permanent musical organizations exist, special rates for concerts can usually be obtained for school children.

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These are a few suggestions as to what can be done to further musical knowledge and taste. The main thing is to arouse school authorities and school teachers to earnest thought about their importance and their possibilities, and they will find ways for their attainment.

General suggestions for the teacher

Several suggestions for the teacher are in place before leaving the discussion of the lesson which seeks to arouse appreciation. One is that knowledge must form its basis. A poem is not merely beautiful, a picture pretty, or an action noble or base. They are these because of certain qualities in them. Appreciation must rest upon knowing these qualities or facts. Without understanding, we may have no sentiment, we may have the wrong sentiment, or we may be led into unwise action.

Another suggestion is that over-analysis is fatal to emotional enjoyment. There was a time when students analyzed every sentence of *Paradise Lost* as far as they went in the time allotted to that poem. Few will claim that this process influenced the literary appreciation of the students. It was more likely to engender a lasting dislike in the minds of the victims. It is not necessary to know how to pronounce every word and to be able to define it, in order to get the spirit of a good story or poem. There is danger of being too microscopic, of giving too much time and

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effort to details. It is better to determine what the essential things are and let the rest pass with little notice. One must seek the proper mean between no knowledge and knowledge in such detail that it smothers or prevents emotion.

Still another suggestion is that since emotional states are communicable and are frequently aroused in pupils through their imitation of the teacher, the teacher should keep his own emotional states alive. His enjoyment of music, art, literature, architecture, his attitude toward historical situations, present-day questions, vocations, amusements, civic duties, his approval of moral qualities, his contempt for the base, the cowardly, the unworthy, are quite likely to be reflected in his classes. If his pupils admire him, they tend to follow his interests, and it behooves him to have worthy interests, to keep them active, and to make them manifest.

A very important fact to remember is that the æsthetic sense is sometimes slow in developing and that it is not equally distributed. Some people have more than others, and some are more appreciative in certain directions than in others. In some of its aspects, taste may grow rapidly; in others, it progresses slowly. It may require a long time to elevate the taste of some people from "musical noise" to good music, from chromos to masterpieces, and from literary trash to literary classics, but the task is not hopeless. We may never succeed in reaching our ideal, but by perseverance and

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intelligent effort, the teacher will undoubtedly elevate the nature of the appreciations experienced by his pupils. One needs to be cautious about undertaking too much at once, and about expecting fully developed taste in young or undeveloped pupils.

The final suggestion is that often the emotional state aroused should be directed into some channel of activity. Self-government leagues, the Boy Scout movement, social service clubs, nature study clubs, art leagues, musical clubs, and the many similar organizations represent the crystallization of sentiment into organized activity. They are suggestive of what may be done with groups of pupils. The forms of activity for individuals are numberless. The main thing is to turn fine sentiment into fine action and not let it go to waste.

Summary. (1) The lesson which has for its aim the arousal and guidance of appreciation is necessary because it is the purpose of education to elevate and train taste and feeling as well as to impart knowledge and increase skill. (2) The kinds of appreciation considered here are (*a*) social, which deals with human life and interests, and (*b*) æsthetic, which considers the field of recreations and pleasures in music, art, literature, and the like. (3) The worth to be appreciated may consist in the thought considered, in the form in which the thought is conveyed, in human motive or action, or in natural form, color, grandeur, or other element. (4) It is suggested to the teacher that appreciation to be intelligent must be based upon knowledge; also, that over-analysis of æsthetic elements sometimes begets disgust rather than appreciation. Since imitation influences appreciation, it is

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advisable for teachers to learn to enjoy and approve of what they desire their pupils to appreciate. The æsthetic sense sometimes develops slowly and is not evenly distributed, and the teacher must therefore be patient and discriminating in his treatment of individuals. Emotive states are intended to furnish the basis for activity. The appreciations and fine sentiments of pupils, once roused, should function in some appropriate way either through individual or group activity.

REFERENCES: T. H. Briggs and L. D. Coffman, *Reading in the Public Schools*, chaps. XVIII and XIX; G. D. Strayer, *A Brief Course in the Teaching Process*, chap. VII.

EXERCISES

1. From the school textbooks in literature or reading, prepare a list of five things which should be used to arouse feelings of appreciation.
2. Prepare a similar list in history.
3. Choose another subject in which you are particularly interested and select from it several incidents or situations which may be made the basis of appreciative feeling.
4. We sometimes permit unsightly things to continue because we have never realized that they are unsightly or that they might be done away with. Suggest ways of making a community aware of ugly features within its bounds and of the means of improving them.
5. What might possibly be done through school children to improve the appearance of the neighborhood?
6. Do you think schools would be justified in spending less time in teaching pupils to read music and more time in making them acquainted with musical masterpieces?
7. What worth do you find for appreciation in *Evangeline, Hiawatha, The Children's Hour, The Cotter's Saturday Night, Snow-Bound, The Lady of the Lake, Merchant of Venice, and Julius Cæsar?* What in Tennyson's *Ulysses* and *Sir Galahad?* What in Wordsworth's *Daffodils?*
8. What is there worthy of appreciation in Michael Angelo's statue of David, or of Moses, or in his painting of "The Last Judgment"?
9. Name some pictures you would select for class study for pupils

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and some you would not select. Give the reasons for acceptance or rejection.

10. Have you ever done anything to influence the kind of jokes enjoyed by pupils? How could the correcting of jokes for a class joke book be made to help the taste of the class?
11. Cite two or three instances of pupils finding pleasure in an author's language. What was it that gave the pleasure? Suggest some means of extending pleasure in language.
12. Why do pupils like *Treasure Island, Old Ironsides, Barbara Frietchie, Sheridan's Ride, The Jungle Book, Black Beauty, Beautiful Joe,* and *Pinocchio?*
13. How about allowing pupils to select, or at least to help select, the pictures to be bought for the school?
14. How could dressing dolls or preparing designs to be used for decorative purposes be made a means of influencing taste?

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XI

SOCIALIZING EXERCISES

What the socializing exercises are intended to accomplish

POSSIBLY no recent movement connected with the schools has been more marked than the tendency of the last decade to bring them into more intimate contact with the activities and problems of the social life of to-day. This movement has been influential in two directions. The experimental psychologists have raised the question of the validity of the doctrine of formal discipline. This doubt has caused us to question the advisability of conducting the schools solely for the sake of achieving mental discipline and cultivating power to be used some time in the future. This changed view has in turn resulted in an inspection of the course of study to discover just what parts are being taught for the purpose of bringing about discipline and power.

From another viewpoint the leaders in education have maintained that the school should represent life itself and should not be regarded merely as a preparation for life. They have urged the removal of the barriers between school and society and have insisted that education should be a socializing process. From their

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side they have subjected the course of study, the teaching process, and the general activities of the school to a searching examination to discover how they may be brought into harmony with these social purposes. The expressions, "Socializing the curriculum," "Socializing the school procedure," are current to-day. The pupils are not merely to have the mental processes, such as reasoning, memory, and attention, trained, but are to live as members of a society, and are, in learning, to socialize the subject-matter; that is, to give it a social content, to see how man has affected it, how it affects man, and to learn the social purposes it serves. This changed view of the school is far-reaching in its effects. Few school activities or subjects are free from its influence. Any exercise which tends to further social activity or social outlook, which gives insight into social conditions and usages, or which influences the attitude toward society, may be regarded as a socializing exercise.

It is at once apparent that a socializing exercise may be a part of any one of a number of school activities. It is also evident that it may at times be incidental to them, or that it may be their main purpose.

Forms these exercises may take

a. Acquisition of knowledge of social conditions, needs, and activities. To be intelligent in its efforts, social activity must be based upon a knowledge of the conditions in which it is to operate. But being social does

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not always involve actual physical activity. It may, and often does, mean putting forth effort to help others but it may mean possessing an interest in people, being sympathetic, cherishing an attitude of helpfulness. When opportunity arises these social feelings tend to reveal themselves in action.

But interests and attitudes are based upon knowledge of some kind, and the increasing of knowledge is one of the functions of the school. Any school exercise is a socializing exercise, in which the subject-matter is made to yield its content in such a way as to throw light on the lives of people, their occupations, their joys and sorrows, their achievements, their social institutions, the conditions under which they live, whether geographical, political, or economic, and the like. Much of the teaching from day to day may thus be socializing either directly or incidentally. This is especially true in the elementary schools where the purely scientific aspect of the various subjects is not the main purpose of teaching. Experience is to be remade in the direction of more *socialized* content. It would be scientifically correct to give the exact and the relative location of Russia, to describe its surface and its climate, to state its form of government, and to name the present ruler, but such an exercise would be negative in its influence upon the social interests and attitude of the pupils because of its lack of social content. The needs of the people socially, industrially, and politically as revealed by the recent emergence

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from serfdom, by the educational situation, by the lack of general religious freedom, by the struggles toward political independence, by the backward stage of development of agriculture and manufacturing, and by other facts which may readily be obtained, — these introduced into a lesson result in social insight and social interest, and transform a lesson of mere fact into a socializing exercise.

The possibilities of presenting subject-matter in such a manner as to increase social knowledge and to influence the feelings of pupils have not been fully grasped. Possibly some teachers will admit that in geography, history, and literature these ends may be reached to some extent, but they can see no social bearing in art, music, arithmetic, and the other subjects of the curriculum. It is possible that the social bearing is there and that the teachers have not seen it because they have not looked for it. Some suggestions in regard to content of this nature will be presented later in this chapter.

In addition to the social possibilities of the content of the subject-matter employed, there are opportunities of making class exercises social through the use made of the subject-matter and through the means employed to prepare and present lessons. When foreign languages are taught by the conversational method, instead of through the grammar; when letters are written and sent to real people; when pupils tell time so as to keep track of their lessons or to know when to

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go home; when they add or count so as to distribute supplies or keep score in a game; when they measure materials and compute cost in sewing, manual training, or cooking, — social values and usages appear which justify us in considering such exercises as socializing. Intrinsic functions are employed, and these, by definition, are social. A thoughtful principal in one of the schools of New York City undertook to teach the pupils who had just come from continental Europe to give the correct sounds of *th*, *ch*, and *wh* by having them make the sounds over and over again. They learned to give the sounds correctly, but did not use them in speaking. She then gave lists of words containing the sounds. These lists were mastered, and still the speech did not show the effect of the exercise. It was only after drill on ordinary sentences in which these sounds occurred that correct usage was finally secured. This principal's experience is suggestive of much that may be done to *socialize* subject-matter by placing it in its proper setting, and making it serve its intrinsic function. Its value is enhanced in the minds of the pupils, and mastery of usage as well as knowledge of the service it renders is furthered.

b. School activities involving coöperation or consideration of the welfare of others. Suggestions as to socialized work on the part of the pupils are given in the chapters on the assignment and the recitation. When the same assignment is given to all pupils, when the recitation consists in saying to the teacher what has been read

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in books or what the teacher told the class in lecture form, when helping others is frowned upon, then it is a case of each pupil for himself, — of the survival of the fittest, the fittest being those who can attend regularly and memorize readily. When, on the contrary, individual members of the class undertake to prepare a certain part of the lesson to report to their classmates, then efforts assume a social value, since they are working not only for themselves but for others. The pupil who ascertains for the class how much coal costs per ton, or what brass is, or to whom violations of the fire ordinances should be reported, or renders any service for his fellows, is performing a socializing exercise. He may make a piece of apparatus, invent a game, find material of some kind, or search out knowledge ; so long as it is done for the class and not for his selfish gratification, it must be classed as social.

Another exercise of this nature is the group work in school. An assignment is made to a group of pupils, or the group volunteers to accomplish a piece of work. Group work means the selection of a leader, loyalty to the leader, the division of labor, and the faithful performance of the work assumed; in short, it means coöperation. It includes not only working with others, but also, when occasion demands, working for others. The group may not only prepare work upon which it reports to the class, but within the group, service is frequently rendered by one member to another by sharing materials, or by helping with outlines, charts,

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or other work. It is a distinctly social situation and as such has value aside from the knowledge gained through it.

These group assignments are helpful in connection with geography in studying such subjects as polar explorations, the industries of a given city or country, the digging of the Panama Canal, the means employed to offset the lack of rainfall in the Western States, and many other topics.

In history, where there is so much ground to be covered, there is ample opportunity to employ group work as a means of saving time. Such topics as the following are merely suggestive: (1) The relative merits of the claims of the French and English to the Ohio Valley; (2) the treatment of the Indians by the various nations which explored America; (3) the territory explored or claimed by European nations in North America; (4) the forms of government in the colonies before 1776; (5) the Revolutionary War from the standpoint of America and Great Britain; (6) the story of slavery in this country; (7) the political parties which have existed in the United States.

In civics, the subject of street cleaning makes an excellent group assignment. Individuals in the group can organize and assign the subject under such subheads as snow removal, garbage removal and disposal, the work of the sweepers, the mechanical devices employed in street cleaning, and how the public can aid in the effort to keep a city clean. The individuals can

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prepare their parts, and the subject then can be presented as a whole before the class with profit to all concerned.

In cooking, sewing, and manual training it is not at all uncommon to find several pupils working on one project, whether it be baking a cake, making a dress, or constructing some article of furniture.

In dramatization, the group may either present a story which has already been put into dramatic form, or the members may write the play and then give it before an audience.

A committee on music selects and gives a musical program, arranges to have others give it, or composes a class song, or other exercise. Here again is group work, coöperative effort put forth for the class or school.

The subjects cited are by no means all that afford opportunity for group activity. In literature, in art, in science, as well as in other subjects of the elementary and high-school curricula, many topics and situations can be handled to advantage in this manner. Debating necessitates it; other exercises afford occasions for its employment.

In addition to the school exercises which have for their object the gaining of knowledge and the influencing of social outlook, there are many school activities which are socializing in their influence. One of these exercises is the school housekeeping which is done by members of the class and which includes the care of

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cupboards, blackboards, window sills, plants, birds, fish, school supplies and apparatus. Many teachers never think of delegating this work to others; consequently they tire themselves out in performing it and deprive the pupils of the opportunity of being helpful. The plays and games and athletic sports of a school are essentially social in nature. A pupil must be a good fellow, he must play the game, doing his part and being either a good winner or a good loser. If the leader sends him to a subordinate position, he must learn to take his place and do his best there. Team work is the great factor in many of the school sports, and consequently a player must expend effort not merely for his own sake, but for the sake of his team and his school.

The school in which the pupils are as "dumb, driven cattle," doing what they are told, as they are told, when they are told, and the school in which the pupils do what they please, as they please, when they please, represent the extremes of tyranny and license, and in neither type is there adequate opportunity for the development of the social virtues. Through the organization and discipline of a school much can be done to afford practice in effective social work without having scholarship at a low ebb, or responsibility and obedience lost sight of. The election of class officers to report absences and tardiness, to take charge of the classes when the teachers are summoned from the room, to conduct the classes through the corridors, and at dismissal to marshal the lines out of the build-

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ing; and the use of monitors to take charge of yards and corridors, to look after the condition of the building, and to care for the pupils' wraps and hats, are two suggestions as to what can be done in this direction. If these school and class officers be elected by the pupils, the effect upon both the school and the officers thus chosen is often better than when some one in authority appoints the pupils to perform these functions. The ideas of choosing those whom they know to be most worthy and most capable, and then of rendering prompt obedience to the officers of their own choosing, can be instilled through conferences with the pupils or in talks by teacher or principal when proper occasion offers.

The extent to which pupils may participate in school government with benefit to themselves and to the school, will vary with the nature of the school and, it may also be said, with the nature of the principal. Some principals, in order to conduct a school on such a plan, would have to be made over because of their predisposition to exercise control, or because of the habit of absolute rule formed by years of experience. Wisdom, patience, tact, all are necessary in undertaking and carrying out the plan of giving the pupils a share in the school discipline and management. On the other hand, some bodies of pupils are better prepared to assume such participation than others and can safely take a larger responsibility. They have more background in the way of knowledge and attitude. But

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as both of these are the result of education, whether in school or out, it is possible that those less well fitted at first for such duties may be prepared by degrees to assume more responsibility. The George Junior Republic represents the fullest embodiment of the plan of self-government, but it is not a school, and its economic and social necessities cannot be fully reproduced in any ordinary school. Its plan of operation, however, suggests much that is valuable to those who are in charge of schools.

The school organizations controlled entirely or in part by pupils are recognized more and more to have a decided value because of the social training and discipline they afford. Some of these are the sewing club, cooking club, nature study club, walking club, school garden association, literary society, glee club, school orchestra, and the debating society. Probably no school will have all of these clubs in operation, but it would be the exceptional school which could not most helpfully have some of them.

c. Organization of activities which function in the school neighborhood or community. In addition to the clubs and societies which work for themselves and the school, there are several which the school can set in operation which reach over into the homes and the neighborhood in their operations. One of these is the Social Service League, the members of which pledge themselves to strive for cleanliness and fresh air, to abstain from throwing rubbish into the streets, to

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keep from destroying or marring property, and to influence others to follow the same aims. Others are the Little Mothers' Clubs, the Parents' Associations, and similar societies. In these clubs, home, school, and neighborhood are brought into very close contact and made mutually helpful.

Helps which the teacher may employ in developing social insight, attitudes, and habits

a. Social instincts of pupils. The fundamental help, without which no efforts to socialize can succeed, lies in the instincts possessed by the pupils to be trained. Several of these instincts furnish a direct basis for the training proposed and should be called into play or given the opportunity to develop naturally instead of being repressed. Among these native tendencies are the instinct to imitate, to do as others do; the gregarious instinct, or the instinct to seek the society of one's kind; the instinct to emulate, and the instinct to outdo others, both of which can be turned to social use; the dramatic instinct; the instinct of leadership; and the instinct to be kindly, sympathetic, helpful. This most helpful inheritance ought to be utilized much more fully than it ever has been and made to function freely. All too frequently we neglect it for the sake of imparting a body of facts or for a dubious amount of mental training. Knowledge should be imparted and minds should be trained, but this other large field should not be left uncultivated.

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b. Subject-matter. A second help which the teacher may call to service is the subject-matter. Some of the possibilities have already been suggested in this chapter. The trouble is that the social possibilities are only infrequently suggested by the books and the teacher must seek them himself. A few lines of effort are herewith suggested.

The teacher who caused her class to see that the people of Great Britain who attempted to run the blockade of the seaports in the Southern States during the Civil War, did so because of economic conditions among the manufacturing classes, socialized the lesson. A lesson in manual training, such as weaving, which leads to the study of that industry, of how people have developed the process, of the great mills devoted to it, of the number of workers, their wages, their housing, the labor of women and children, the attempts to protect the lives and interests of these people, of efforts toward social improvement, and the like, is a socializing lesson.

Civics, a subject which deals exclusively with social activity, has great possibilities in the way of increasing social insight, interest, and activity. Frequently it deals only with the form of government, the election and duties of public officers, and similar material. Dr. Thomas J. Jones, of the United States Bureau of Education, makes these suggestions in regard to it: —

> Good citizenship should be the direct aim of the high-school courses in social science and history. Good citizenship is the test that must be applied to every topic in these courses.

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Facts, conditions, theories, activities, which do not contribute directly to the appreciation of methods of human betterment, have no claim on the time of the high-school pupil. . . . Every pupil should know, of course, how the President of the United States is elected; but he should also understand the duties of the health officer in his community. It is the things near at hand and socially fundamental which should be taught first of all. Comparatively few persons have any need of knowledge of congressional procedure, but every citizen should know what are the chances of employment for the average man.

Some of the topics suggested by Dr. Jones are community health, housing and homes, pure food, public recreation, good roads, parcel post and postal savings, community education, poverty and the care of the poor, crime and reform, family income, savings banks and life insurance, human and material resources of the community, human rights *versus* property rights, impulsive action of mobs, and the selfish conservatism of tradition, public utilities, like street-car lines, telephones, and light and water plants. "The purpose is not to give the pupil an exhaustive knowledge of any of these subjects, but to give him a clue to the significance of these things to himself and to the community, and to make him want to know more about the conditions under which he lives. It is to help him think civically, and, if possible, to live civically."

Arithmetic, which has to do with computations, yields much in the way of socializing content when it is pressed into service to throw light on amounts and

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values as they affect social life. A third grade in the Speyer School of Teachers College found out from the firemen across the street how much oats and hay were fed to the horses daily and how much they cost. Then they set themselves a number of problems, such as finding how much it cost to feed one horse per day, how much it cost to feed all the horses in that engine house per day, how much for a week and for a month. Then they found out how many pieces of hose there were in the engine house, the length of a section and the cost per foot, and computed the entire cost. This exercise soon began to arouse their wonder over the amount it must cost the city to keep up its many engine houses, because, they reasoned, there were engines, hose carts, hook-and-ladder wagons, and horses to be bought, and the men had to be paid for their services. Through a messenger to the fire chief, they found the average number of fire calls per day and the estimated cost of each call. Their computations simply gave them a glimpse into great numbers, as they could not grasp their full significance, but they gained an appreciation of the extent and cost of the department which they did not have at the beginning, and even discussed gravely how very bad it was to send in false alarms just for fun, since it cost the city so much money.

Another class in a third grade investigated the removal of snow from the block in which the school was located. The pamphlet containing the city require-

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ments in regard to removals was obtained from the street commissioner. The removal was paid for by the cubic yard. The size of a cubic yard was determined by using the yardstick and by placing pupils at the corners of the yard-square space laid off on the floor. The yardstick itself gave the height when held with one end resting on the floor by one of the boys who marked the corners. The carts and wagons removing snow were plainly marked so as to show capacity in cubic yards. The numbers of several were taken and an average capacity estimated. The price per cubic yard being given in the pamphlet, the cost of a load was reckoned. Through inquiry the pupils learned how many trips a cart could make to the dumping place in a day. Then they computed the earning of one cart for a day, and the earnings of the total number of carts working in the block.

The pupils in Connersville, Indiana, who undertook to decide whether it would be better to go to Oregon or to Georgia to engage in fruit-growing, had to socialize the exercise of letter-writing and the subjects of geography and arithmetic in order to communicate with railroad companies, and agents of land companies; to determine conditions of soil and climate, also transportation facilities; and to compute cost of transportation, cost of land, cost of cultivation, of yield per acre, of probable profit, and the like. And the group of pupils in the same city who undertook to select a lot and plan a house, the cost of which was to be

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kept within a stipulated amount, had a most socializing experience. The prices of real estate in their own city, the desirability of locations, the way excavations are computed, how masonry is laid and what it costs, making contracts, the purchase and cost of materials, even to the electric wiring, were all a part of their education in connection with this series of problems.

The study of foreign languages, whether ancient or modern, contains possibilities of contributing to social insight and interest if it be so considered that, instead of being a mere exercise in translation, composition, analysis, and parsing, it is made to throw light upon the life and customs of the peoples among whom these languages are or were the mother tongue.

c. Organization of school. Community help. A third help lies in the form of organization and the helpful participation of pupils in the discipline and other activities of the school. A fourth possible source of help lies in the coöperation of parents and officials. In some communities school credit is given for practice at home of cooking, sewing, gardening, and manual training. With help from parents, such an arrangement unites home and school closely. If representatives from the various municipal organizations can be secured to talk to the pupils about fire prevention, use and care of parks, how pupils can help the department of street cleaning, and upon similar topics, interest, and conduct governed by interest, are quite sure to result.

d. The teacher's own spirit and attitude. One of the

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greatest helps is the teacher's own attitude toward, and his enthusiasm in, this cause. A tyrannical, carping, critical teacher or principal renders social efforts useless. He is out of sympathy with them and acts as a damper to all enthusiasm and interest. But with interest and enthusiasm present, the teacher must employ common sense, and keep the pupils within the bounds of what they can accomplish. Too rapid expansion usually brings failure and disgust. "Slow and steady" is better than allowing enthusiasm to run away with even a good cause.

e. Miscellaneous helps. There are several miscellaneous aids which should not be overlooked. The newspapers and periodicals present much valuable material to add to social knowledge and interest and should be used for that purpose. A good, up-to-date bulletin board is very helpful. Pictures are often very revealing in their presentation of people and conditions, whether prepared by the artist or obtained by means of a camera. The stereopticon and the moving pictures are becoming more and more educational in their use. The stereoscope, usually of easier access, is also an excellent aid in imparting knowledge and arousing interest. Doubtless the teacher will be able to suggest a number of other means of furthering these purposes.

A caution is possibly in order in closing this chapter. We need to train pupils to lead, to coöperate, to serve school, home, and community, to lend a hand when it is needed. But we must not lose sight of the fact that

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there are frequent occasions when *every* member of a class must be held *individually* responsible for the learning of certain lessons and the performance of certain exercises. These cannot be delegated to some kind-hearted friend. They must be done by each for himself. This is imperative, and we must not overlook it, otherwise there is disintegration and confusion, as some have discovered at a heavy cost. Good sense is just as necessary here as in most places, and must be exercised for the sake of the class and the school. Each teacher should follow some lines of socializing work with his class, but he should remember that the pupils are in school because they are immature and need help. They must be kept within certain limitations both as to amount and methods of undertaking, and the teacher must be a partner ever to be reckoned upon, though he may at times be a silent one.

Summary. (1) The socializing exercises are intended to give insight into social needs, conditions, and customs; to arouse interest, and affect the attitude of the pupils toward society; and to give practice in social service. (2) These exercises may take the form of classwork and study; of school activities involving coöperation or the consideration of others; of organizations and activities which function outside of the school. (3) In accomplishing the desired results the teacher may employ the instincts of the pupils, the subject matter and supplementary material, the school organization, the coöperation of parents and of public officers, and his own interest and enthusiasm. He should resort to the use of newspapers, periodicals, pictures, the stereopticon, stereoscope, moving pictures, talks from officials, and other means

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of gaining social knowledge or arousing interest and shaping opinion. (4) The necessity of work from the class as a whole and of individual responsibility should not be overlooked.

REFERENCES: — *Teachers College Record*, vol. IV, no. 2; vol. XIII, no. 5; G. H. Betts, *Social Principles of Education;* Colin Scott, *Social Education;* Briggs and Coffman, *Reading in the Public Schools*, chap. XXVI; John Dewey, *School and Society;* W. C. Bagley, *Educational Values*, chaps. IX–XV.

EXERCISES

1. "Pupils have sufficient opportunity outside of school hours to exercise their social side. The school should spend its time imparting knowledge." Argue either for or against this view.
2. If schools are to be regarded as a part of society and not a preparation for life in society, what changes must be made in them to meet the situation?
3. Illustrate the socializing of arithmetic through its subject-matter. Through the method of teaching it.
4. In a similar way, illustrate the socializing of composition.
5. Show how, through resort to group work, much more subject-matter can be studied in geography than would otherwise be possible. What effect will such work be likely to have upon the interest of the class?
6. Plan three entirely different assembly exercises which are to be prepared through appeal to the social interests of pupils.
7. What value is there in school housekeeping by pupils, aside from the fact that the room is kept in order?
8. If you have ever observed self-government in operation in a school, tell of its most serious faults and its greatest virtues as you saw them.
9. Is it wise to give pupils no responsibility in school discipline? Is it wise to give them all of the responsibility?
10. Some pupils have a capacity for leadership, for managing people. They sometimes employ this capacity in harmful ways. Is the capacity one which should be suppressed or one which should be utilized in helpful ways? Is it always easy to utilize it?
11. How much social development is a teacher likely to accomplish in his class who himself is not interested in social conditions and who regards his teaching merely as a means of earning a salary?
12. How can the subject-matter relating to Argentina be socialized? Illustrate.
13. What possible social content is there to the subject of decimals?

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XII

THE FORMATION OF HABITS AND THE INCREASE OF SKILL

Reason for such exercises

In addition to the various types of teaching which aim to increase knowledge and to arouse æsthetic and social appreciation, there are school exercises which have as their main purpose the increase of skill and the rendering of certain processes automatic or habitual. In regard to skill, Thorndike [1] says: —

No one would assert that skill is the total aim, and no one would deny that it is a fraction of the aim, of education. The chief facts about it which are likely to pass unnoticed are, its appropriateness where the effort to give knowledge is relatively wasteful, and its service as an impersonal pleasure. Skill, as in the trades or household arts, can be got, even in high degree, by boys and girls who, by lack of capacity or interest, or both, can get little knowledge of general principles. So, in proportion as schools are attended by a wider and wider selection and retain the unscholarly types till sixteen or eighteen instead of till twelve or fourteen, skill becomes properly a larger and larger factor in their proximate aims. Skill may also be, for almost all individuals to some extent, a source of impersonal pleasure. The taste for workmanship — the impulse to do the job as it should be done, making a first-rate product by fit means — is one of the most easily developed, but also one of the best, virtues. It is com-

[1] E. L. Thorndike, *Education*, chap. III.

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monly more truly cultural or refining than an interest in correct manners, speech, or opinions about the fine arts, because it is commonly more sincere and less tainted with ostentation.

Whether we become hewers of wood and drawers of water, whether we become artists, or whatever our walk in life, our hope of getting along at all lies in learning to respond in definite ways to the situations which daily and hourly confront us. Fortunately for us, nature has so constituted us that we tend to repeat associations once formed, to act as we have acted before; so that our responses, our thoughts, our actions tend to become habitual. We form the habit of associating ideas with things in the outside world, as when we hear a series of sounds and think "Star Spangled Banner"; we associate ideas with other ideas, as when we think "Star Spangled Banner, battleship in the harbor, lowering the flag, sunset"; and we associate ideas with actions, as when the thought of sunset leads us to turn our faces to look at the sky. Once having associated certain objects, ideas, and actions, we tend to put them together in the same way again, as shown by the illustrations given.

The object of this tendency to make associations habitual is to enable us to master our surroundings, to think, to communicate with others, to preserve existence, to make progress. Since the school is vitally interested in all of these purposes, it ought to further the operations of this very important native tendency and to employ it whenever any phase of school activity

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possesses elements which should be made automatic. Automatism means the saving of time, the freeing of consciousness for other tasks, and may be made to mean a high degree of efficiency. The school exercises which have for their object the rendering of certain associations and acts automatic are called drill lessons.

The field included in habit-forming exercises

Dr. Rowe,[1] who has treated exhaustively the subject of habit-formation, says: —

Of the subjects taught in the elementary schools, reading, writing, arithmetic, composition, spelling, singing, drawing, and other forms of manual work have habit-forming rather than information as their direct aim. Nature study, geography, history, and civics deal rather with the acquiring of information, the organizations of facts. Some of these organizations need to become automatic, in order that rapid use may be made of them in relating new material, and others may contribute important aid in the formation of disciplinary or moral habits. History, especially, without furnishing much material for direct habit-formation, indirectly contributes abundantly to morality and the habits implied in character by making concrete the ideas underlying such habits, by furnishing initiative through suggested motives, by making a basis for practicing habits of approval or disapproval, or by showing the painful, serious, and unfortunate results of lapses.

In the high school, language subjects, mathematics, and the arts are largely habit-forming, while science, history, literature, and the like are informational, with occasional organizations to be made automatic.

[1] S. H. Rowe, *Habit-Formation and the Science of Teaching*, chap. XIII.

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Any subject which contains elements, whether ideas or acts, which may be used as responses to certain situations without one's stopping to think about the matter, possesses to that extent the possibility of habit-formation and of drill to secure the habit. In learning to spell, we form the habit of using letters in a certain order. In learning to read, we associate certain sounds with certain letters or groups of letters, and associate meaning with written or printed words and sentences. In writing, we reduce certain movements to the stage of habit. In counting and in the multiplication table, we learn numbers in definite order and also in combinations. We form the habit of thinking and saying 42 when we see 6×7. In music we form the habits of reading the signature, of reading notes on the staff, of singing as notes indicate, of making tones of certain quality, and the like. In composition we acquire habits of punctuation, of indenting, of using capital letters, of writing paragraphs, of forming correct sentences, of choosing words with care, and other habits peculiar to the subject. Committing to memory is simply another phase of habit-forming, since we associate words in an order which we thereafter follow. We make this order a *habit*. In drawing, the holding of pencil or brush, the stroke, the manner of shading, the way of mixing colors, and other details are all possible habits. In geography, the interpretation of globes, maps, and charts is a matter of habit, as is also the learning by heart

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of capitals, rivers, and the factors which influence climate.

In manual training, the use of the plane reduces to the automatic, as does the use of thimble and needle in sewing, and the beating of batter and the whipping of eggs in cooking. There is so much of education which consists in reducing actions or associations of ideas to the automatic state, and the process of habit-forming is so important and so definitely known, that every teacher should inspect the material and processes he is to give his class in order to discover what part should be made a mental or physical habit, that is, made a matter of mental or physical memory.

It will not do to say, "It is enough if the pupils once understand. They will remember if they understand." The trouble with this theory is that it usually fails to work. Nor will it suffice to leave the amount and kind of drill to the judgment of the pupils. This procedure, also, is a failure when viewed in the light of consequences. There must be drill, and the drill must be intelligently conducted if certain facts are to be learned as permanent possessions and if certain acts are to be performed automatically.

Procedure in habit-formation

In lessons to form habits, as in other exercises, it is essential that the pupils feel some reason for the work, are aware of a motive, in order that they may bring intelligence, interest, and energy to bear upon it. If

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they make *y's* poorly or slowly, it is not difficult to make them realize the fact and to want to do better. They know if they spell poorly, if they write numbers slowly, if certain combinations of letters are always difficult to sound; or they can easily be made to realize it. A little boy in a first grade left the reading-line, went to the blackboard, and, placing an accusing finger on a combination of letters in a word, said, "That always sticks me." He knew his difficulty and the drill he promptly received was shared energetically by him. A third-grade class, at the close of an exercise, in which the cost of a meal for a needy family had been computed, was asked what they had found out. One of the replies was that they needed drill on the multiplication table of 6's. Here, again, was consciousness of a definite lack or need. Making pupils conscious of the purpose or motive of the drill exercise is the first step to be taken.

The sources of motive are varied. As indicated in the preceding paragraph, one source is the realization of a definite practical need. Children are aware of the need of accuracy and rapidity in number combinations in order to distribute supplies; to make plans for garden plots; to measure materials for manual work and compute its cost; to solve such problems as those involved in dealing with snow removal and the fire department as discussed in another chapter. They wish to write well enough to be able to write notes to their parents; hence the necessity of drill to bring this about.

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They must read well to make out the interesting stories or to be permitted to visit another class and read a story to it; therefore they must practice. The class in geography may need a drill lesson because of inability to read maps readily, to interpret isothermal lines, or to apply the factors influencing climate. They can be made aware of this need and usually know their weakness quite as well as the teacher. They know, too, that they cannot write numbers accurately and that many errors are due to that fact; that they cannot read music rapidly and that accidentals in music are a calamity. If asked, "What is the trouble?" they are usually ready, like the small boy with his hard word, to point out definitely the thing they need. Sometimes this need is practical, as in the instances cited; sometimes it is æsthetic. The thing done does not come up to the ideal, as in the quality of lines, the applying of colors, the composition of pictures, the formation of good paragraphs, the writing of a good introduction. One may work accurately and rapidly and still fail of æsthetic quality in the product. Here again is a motive in realizing the discrepancy between what one has done and what one ought or would like to do.

Children will expend great amounts of interest, energy, and time in drilling on material that is to be used in some kind of competitive exercise such as a spelling-match. They will drill on lists of countries and capitals, on events and dates in history, and on any material which can be employed so as to pit one

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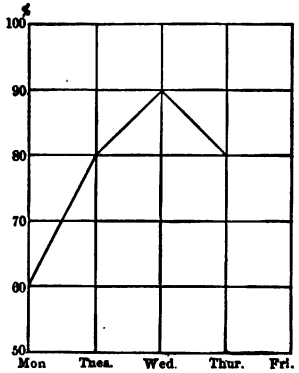
group of pupils against another. Pupils have been known to practice vigorously so that they might lower the time in which their row in school could spell a hundred words and so beat all the other rows. This class was fairly accurate, but was very slow in oral spelling. This exercise cured the defect. Competition of group against group is a very effective motive for drill.

A pupil will often work to improve his own record, thus competing with himself through practice. The accompanying device is effective with some children:—



A pupil who needs drill in spelling is given a card with a diagram similar to the figure drawn on it so that he can indicate his own standing every day for a week. On the diagram here given it is supposed that the pupil's standing on Monday was 60 per cent. A cross is placed on the vertical line for Monday beside the number 60. On Tuesday, the standing is 80. The pupil places a cross on the vertical line for Tuesday opposite the 80 and draws the line from the Monday's record to the Tuesday's record to show the direction he has traveled. On Wednesday his grade is 90. Again he places the cross and draws the line, which still ascends. On Thursday, for some reason, his standing is

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80, and he must draw his line down instead of up. The chances are that the line next day will again ascend, as people would usually rather record a good standing for themselves than a poor one and will in consequence work to make this possible. Self-competition is, therefore, a motive not to be overlooked in the effort to secure drill from young people. The teachers in a certain city keep the Ayers' scale in penmanship posted in their rooms, and the pupils take their own work up to the scale as it hangs on the wall, and, by comparison, decide where they belong. They do this, at times, without direction from the teacher, thus showing their interest in their own degree of skill.

Approval of the teacher or parents, or others whose opinion is esteemed, is a motive with many pupils for drill in order to become more accurate or more rapid in execution, or to produce a more beautiful result. We all like approval in some form, and children are very susceptible to its influence. A word, a look, the posting of a good piece of work for classmates to see it, relieving from further practice in the exercise mastered, granting some special duty or activity as a mark of approval of effort and accomplishment, — these are some of the ways in which recognition may be shown when a pupil has produced an excellent piece of work or has improved upon one that was unsatisfactory. The same form of approval will probably not appeal equally to all pupils, and consequently the teacher will find it wise to note the forms which make the strongest

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appeal to the pupils who especially need to put forth effort in the form of drill.

Making a good record, either because of pride in the record or for the sake of advancement, is a motive commonly urged as a motive for practice. Pupils are pushed through drill exercises in order that they may be prepared for promotion. They cannot "pass" unless they achieve a certain degree of excellence, and this they must gain through practice. This is by no means the best motive to employ, but it sometimes rouses the necessary energy and effort when other appeals have failed.

There are still other possibilities in the way of motivating drill exercises. The sources given do not exhaust the list. A final source, possibly the teacher's last resort, is stern necessity. When some pupils remain untouched by the motive which stirs all other members of the class, then these must put forth effort at improvement just because they must. A certain degree of achievement should be attained by all normal pupils, and a miniature Achilles cannot be permitted to sulk idly in his tent simply because he does not care whether he can read, write, spell, work arithmetic examples, or perform other labors which society through its schools sets for him to do.

The second step in drill is making clear what is to be done. If pupils write figures slowly, they should know that a specific drill exercise is intended to increase their rapidity. If they have difficulty in *carrying* in addition, the process should be made clear in

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some way before the drill exercise for facility begins. If pupils read in jerky fashion, the desired mode of reading should be presented so that the children may know how they are to read in the practice exercise. If letters are poorly formed or joined, the exact difficulty must be made clear and correct forms shown, so that pupils may practice intelligently. Whatever the form of the drill exercise, the pupils should know *what they are to do*. It is not always sufficient for them to see what is wrong: they must see, also, what the correct form or idea is. They must know the more excellent way. It sometimes does more harm than good to show the incorrect form and to warn against its use. It is more helpful to show the correct usage and to say, "Do this." Teachers often say to a pupil, "You did not read that well. Read it again"; and the pupil has no guide as to how he should improve. Writing incorrectly spelled words or ungrammatical expressions on the blackboard as forms to be avoided is still a common procedure. Faulty illustrations should be replaced or at least supplemented by examples of correct procedure, in order that the pupils may apply energy at the right place.

The time required to bring to mind a feeling of need or of purpose in a drill exercise and of making the pupils aware of what is to be done does not usually occupy much time. A few minutes frequently suffice for the preparatory work, and then the class is ready for the drill itself, — the habit-forming process.

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The laws of habit-formation

Professor James [1] gives the first law of habit-formation thus: "*We must take care to launch ourselves with as strong and decided an initiative as possible.*" This strong initiative is provided for in the preparatory work, in which the purpose is seen, the idea of what is to be done is clarified, and interest and energy are appealed to.

The second rule given by Professor James is, "*Never suffer an exception to occur till the new habit is securely rooted in your life.*" In other words, keep living up consistently to the thing which is to be made automatic. It is the frequent fate of New Year's resolutions to fall by the way in a short time because the people who make them presently begin to make exceptions and soon find themselves back in the old habit. The reason why some men who smoke have to swear off so often is that they make exceptions to the habit of refraining from tobacco before the habit of self-denial is firmly enough fixed to make exceptions safe. If one is seeking to fix the habit of working neatly, accurately, and promptly, if he is striving for correct posture, or is endeavoring to substitute good habits of speech for poor ones, one cannot safely indulge in the old habits part of the time. The new forms must be employed consistently. Physiologically the breaking-off of an old habit and the forming of a new one mean the discontinuance of one line of connections through the nerve

[1] William James, *Talks to Teachers*, chap. VIII.

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fibers and the formation of another. Relapses from the new line of connections mean that the old one is again followed and is strengthened by renewed use. To yield to an old habit, to say, "I'll do it just this once," is often to break down with one act the barrier of resistance which has been painfully reared against undesirable modes of thought and action. Then the old sweep in upon us like a flood resuming its former channel. The indulgence is always recorded in the nervous system, whether conscience is willing to forgive or not. Then, too, there is the frequent consequence of becoming discouraged, after several lapses, and saying, "It is of no use to try again." The safer plan by far is to suffer no exceptions.

The third law is, "*Seize the very first possible opportunity to act on every resolution you make, and on every emotional prompting you may experience in the direction of the habits you aspire to gain.*" This law is known as the law of repetition. Its purpose is to give control over the new form of activity and so fix it in the nerves and muscles of the body that it will presently operate of itself without the direction of consciousness.

If the use of a tool is to be learned, a correct pronunciation acquired, a good posture made habitual, or the habit fixed of thinking letters, words, or figures in definite combinations as in spelling, memorizing poetry, or thinking of ten when seven and three are added, the ideas or acts or whatever is to be thus fixed in mind, nerves, and muscles must be repeated in correct order

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and must be repeated often enough to make it a part of one's life. In addition to suffering no exceptions when the opportunity offers for using the new mode of acting and thinking, this mode must be made automatic by drill devoted to that purpose.

One cannot say just how much drill there should be, since the amount is determined by several factors. If the effort at mastering a new habit, at increasing skill, results in pleasure to the individual who is working, the amount of drill necessary to master is diminished. If a boy knew that he could go fishing or swimming or to the moving-picture show as soon as he had learned to recite the multiplication table of 9's or to spell a list of fifty words correctly, the time devoted to drill would probably not need to be very long. Then, too, the amount of energy and enthusiasm expended in forming the new habit influences the amount of time necessary to complete the process. One may dislike memorizing, but may go at the task with such vim that it is soon accomplished and the number of repetitions necessary greatly diminished. In learning to spell the word *separate* with *a* instead of *e* in the second syllable, the learning may be hastened by making the *a* emphatic either by saying it with more force than the other letters, by writing it more heavily, by underscoring it, or by some other means expending unusual effort on it.

One of the most costly and least effective modes of learning is repetition which lacks special motive and

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interest, and which is performed with little outlay of attention or energy. What is made into habit or committed to memory in this way is acquired through many repetitions. The process is time-consuming; it lacks intelligence; and we cannot be sure that the results will be used as they should when occasions demand them. Much of this kind of memorizing persists in the schools. Spelling, writing, arithmetical combinations, as the multiplication tables, conjugations, declensions, rules, definitions, gymnastics, and other lessons demanding drill are frequently conducted as exercises in repetition without definite purpose on the pupils' part, without much interest or attention, and without calling forth the energy which would cut the process short and fix the results more certainly.

The necessity of attention

Probably most of us used copy books in our early school days. We wrote the first two or three lines on each page fairly well, and then the work began to deteriorate until the last line was the worst one on the page. If repetition alone were an effective agent in increasing skill, the last line would have been the best in every instance. Another element must be added to it to insure gain, and that is attention. One must attend to what he is doing; he must compare each effort with the model, or with his own previous efforts to see what gains are yet to be made and by what means they can be accomplished. Attention to the motions in-

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volved in so simple a matter as handling bricks brought a saving of effort and an economy of time that years of mere repetition never evolved. Repetition, at best, fixes a certain mode of doing, and may just as easily fix a poor one as a good one. Attention to the process of learning shortens the time of making acts automatic; and it is absolutely necessary to bring about improvement in ways of doing things — to increase skill. Practice alone does not make perfect, but practice *with attention* will advance the learner toward that end because it keeps him conscious of what he yet has to accomplish and makes him alert as to possibilities of improvement in his methods of working. The pupil who copies figures by looking at one, writing it on his paper, looking at the next, writing that one on his paper, and so on, can, by attending to what he is doing, learn to see several figures with one glance and remember them long enough to write them; and the pupil who devotes attention to his writing exercise can more quickly eliminate his errors and increase the control of his movements.

Attention to an object or process cannot be long sustained at a high tension. Experiments have shown that it fluctuates even when the people under observation were striving to keep it constant. The suggestion here for the teacher is that he must not expect close attention to one form of drill to be maintained for a long period. Several short periods of sharp, vigorous drill, with interest and hearty effort, produce

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better results than one long unbroken period, and there is not so much fatigue.

When a class is seemingly wearied and listless, a change in the method of conducting a drill exercise arouses fresh interest, taps a new store of energy, and brings back the wandering attention. The forehanded teacher will have various devices prepared for such lessons and will employ them judiciously. Written drill may give way to an oral one; board drill to seat work; individual drill to a class drill; and drill on facts or processes taken by themselves to facts or processes employed in a game or other setting. If the attention and interest can be held by one kind of exercise until the object of the drill is accomplished, of course it is not necessary to vary procedure. Pupils sometimes greatly prefer one form of drill to others, and in case this preferred form is effective, it may as well be continued. It is useless to vary just for the sake of change. The point to be kept in view is efficient drill, and when change will further this end, its introduction is justified.

The necessity of accuracy

When incorrect associations are made or wrong habits of acting are formed, the labor of learning the correct ones later involves the extra difficulty of unlearning the faulty or undesirable habits, and of breaking up the associations in the nervous system which are the basis of these automatic acts. For some reason,

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undesirable habits seem easy to acquire and hard to get rid of. It is, therefore, most desirable that teachers who consciously train pupils in habit-formation should take pains to see that the first associations are correct, and that the first acts are those which are to be fixed by drill. The position for writing, the manner of holding the pen, the forms of letters, the forms of figures, the order of letters in words, the utterance of sounds in phonic drill, the tones used in singing and reading, reading connectedly instead of in a choppy, word-at-a-time fashion, the pronunciation of new words, the number combinations, and the many other details which should become automatic, are all matters which should be started in the right way. To say, "Never mind for the present. That matter will take care of itself by and by"; or, "When the pupils are old enough to know better, they will do differently," is to disregard the force of habits when once they are formed, and the probability of their continuing as they are begun. It is safer far to begin with the correct habit and thus make sure of it.

Sometimes accuracy is hindered by undertaking to cover too much ground in one drill exercise. The man who said the best way to catch a flock of geese was to chase down and catch *one goose at a time*, disregarding the rest, gave good advice. Too many details at once distract attention, dissipate energy, and defeat the very purpose of special drill. This suggestion applies both to presenting new matter for the habit-forming

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exercise, such as giving new words to be pronounced or spelled, and to the eliminating of errors or associations already formed, as in correcting compositions. It is better to overcome one or two at a time than to try to include all in one exercise.

Necessity of increasing facility and rapidity

When the correct habits have once been started, it is often necessary to consider how they may be made to operate quickly. It is not enough to add correctly in everyday life: one must be able to add quickly as well. A woman who wrote a Spencerian hand almost perfectly was so slow about it that she was able to write comparatively little. Other people, whose writing was not so elegant but who wrote more rapidly and easily, were much more helpful than she. Much time is wasted because we do not drill for rapidity as we might in the various lines of automatic responses. Pupils rise slowly; pass materials slowly; spell, write, and work arithmetic slowly. They spend far more time studying than they should. They ought to be made conscious of the value of the time element and made to shorten the time as much as they can and still keep the product up to a high standard. It ought to be a matter of pride to spend a short time over a lesson, providing the lesson is well prepared. Competition with one's own record or with other pupils should be encouraged. The time record should be kept for the class or for individuals until the habit of prompt

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action is assured. If the teacher watches the various school exercises, he will discover the places where there is a leakage of time and can then stop the waste by special exercises. It is worth while for the sake of the school work and for the sake of the effect upon the pupils' way of working.

Discontinuing drill

There will come a time when drill may be discontinued, but experience shows that it should be diminished by degrees and not stop suddenly. A matter is not fixed once for all, as we know to our sorrow. Drills on the same matter must be given from time to time with intervals of increasing length between the exercises. Professor Thorndike [1] says: —

> For any one habit in any one person there is some one best distribution of time over the series. For one habit or set of habits it may be best to give ten drills of twenty minutes for the first week, ten drills of ten minutes the second week, ten drills of five minutes the third week, five drills of eight minutes the fourth week, and one drill of ten minutes each week for three weeks, and then one drill of ten minutes a month for four months. Or it may be best to distribute the 460 minutes in a very different way.

The drill should be continued, from time to time, until the desired association or habit is fixed. To stop short of that point is practically to lose the time and effort expended up to the point of discontinuance.

[1] E. L. Thorndike, *Education*, chap. IX.

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Memorizing a habit-forming exercise

Reference has already been made in this chapter to memorizing as a form of habit-making. It consists in learning things in the order in which they are meant to recur always thereafter. In much of the committing to memory, the elements are joined in an arbitrary manner, as, for example, the letters in a word, the letters in the alphabet, or the numbers in counting. They simply have to be memorized as they are through any of the means at the teacher's command to make the process short and sure.

Memorizing poetry, rules, or other matter possessing content, is quite a different matter. Here the symbols to be learned in a definite order represent connected thought. Committing to memory such material should follow the understanding of the thought, though this order of procedure is often neglected. There are two reasons why thought should be studied. In the first place, the poem or other selection to be memorized is chosen because of the value of its meaning. In the second place, when the meaning is clear, the process of memorizing is hastened.

Nearly two hundred teachers were asked recently to tell in writing how they would memorize a chapter in the Bible or a poem. In describing the process of memorizing the poem, a large number said they would learn the first line, then the second, then the first and second, then the third, then the first, second, and third, and so on. This mode of teaching poems to children

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can be seen almost daily in some of our schools. The meaning of the whole, the natural stopping-places, such as the ends of thoughts, or thought-units, are quite disregarded. If teachers will go through the poem as a whole with their pupils, talking it over, getting its meaning, enjoying it, and will then take the lines that express a whole thought as a unit to be learned, instead of one line, they will secure better results. Thus the poem, "Daisies," so often taught to children, offers a stopping-place at the end of every two lines, as can be seen by inspection. It is often taught one line at a time: —

DAISIES [1]

At evening when I go to bed,
I see the stars shine overhead;
They are the little daisies white
That dot the meadow of the night.

And often while I'm dreaming so,
Across the sky the moon will go;
It is a lady, sweet and fair,
Who comes to gather daisies there.

For when at morning I arise,
There's not a star left in the skies;
She's picked them all and dropped them down
Into the meadows of the town.

FRANK DEMPSTER SHERMAN.

In this poem each pair of lines answers a question, so regular is the arrangement. In the drill exercise if the teacher asks the question when the pupil recit-

[1] From *Little-Folk Lyrics*, published by Houghton Mifflin Company.

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ing hesitates, the lines which answer will usually come to mind. Some of these questions are: What does the child see when he goes to bed? What does he think they are? What happens while he is dreaming? What does he say the moon is? What makes him think so?

In other selections the length of the thought-units — that is, the parts which are complete in themselves or so nearly so that they afford convenient breaks in memorizing — may vary. The procedure should be: first, to study the whole; second, to memorize by thought-units; third, to repeat the poem or selection until it is thoroughly committed, making the thought a basis for the associations as far as possible.

Learning facts which belong in a series

Many of the facts to be memorized are arranged in series, and others can be so arranged in order to facilitate memorizing. The alphabet, the multiplication tables, conjugations, declensions, lists of prefixes and suffixes, such rules as the one in Latin for the verb compounds which govern the dative case, all offer a definite arrangement to be learned. In memorizing, all the numbers of the series should be learned, and in the order in which they regularly occur. This does not mean that a pupil will memorize the alphabet when he first enters school. When the time comes that requires its mastery, it should then be learned from *a* to *z* in order. The same holds true of the multiplication tables. Eventually the facts of the various tables

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should be learned in order, though the table of 10's may be memorized before the table of 7's. The teacher should be sure that all the members of the series are included, and that they are memorized in the correct order.

The step of application as habit-formation

The last of the five formal steps is the step of application. Its purpose is to make the learner proficient in the use of the new knowledge he has acquired through the preceding steps. If he has just learned what a noun is, he is to identify nouns in this last step until he knows them with a minimum of thought. If he has learned how a fraction is divided by an integer, he is to work problems involving this process until he has mastered it, and the work almost performs itself. He either acquires proficiency in some process, or skill in the application of some principle or other form of general knowledge. In either case, drill exercises are necessary to insure mastery. The suggestions given as to amount and variety of drill in other connections apply to drill in the step of application. It is because this factor in fixing knowledge and processes and in increasing skill has been neglected that so many pupils develop presently into a state of intellectual muddle, and inefficiency. Facts and processes, not being fixed, fade out or become confused, until after a time, the pupils possess what some one has aptly described as "mere tails and fins" of knowledge.

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Teaching pupils to direct the formation of their own habits

The formation of habits in young pupils should be directed closely in all its steps by the teacher; but finally the responsibility can be shifted by degrees to the shoulders of the pupils themselves, and they can be made aware of the steps which should be followed. At first the teacher brings the motive to consciousness, makes clear the facts or processes to be learned, and then supervises or directs the practice by the pupils. When the pupils are far enough advanced, part of the drill may be turned over to them to perform as a task outside of the class period, the teacher inspecting results from time to time. The time should come when the pupils, once seeing what is to be done, can take charge of all the drill necessary to perfect themselves. When they know how to use the dictionary, the teacher need no longer give the correct form when a word is misspelled, but can direct attention to it. The pupil must then find the correct form for himself and perform the practice required to fix the proper spelling. This applies to the use of case forms of personal pronouns, the agreement of verbs with their subjects, and other facts which the children have it within their power to discover. When they are able to find these things for themselves, the responsibility for discovering the correct form should be put upon them.

Can pupils ever learn to doubt their own habits or usages? If this is possible, then the whole process of

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drill can be turned over to them. Do children ever question the spelling of a word they have written, the process they have employed in solving a problem, the grammatical accuracy of their own speech? Do they ever question their own ways of working and wonder if there are other and better ways? To some extent they do, and possibly they can be trained to do so to a greater degree. They can then be made conscious of the entire habit-forming process and can be both encouraged and required to employ it. They should understand that they must see clearly what is to be done; that they must give themselves practice in the operation, putting energy into the process and watching their own work to keep out error and to bring increase of proficiency; and that they must from time to time repeat the drill to insure the retention of the newly acquired knowledge or skill. Probably few teachers have ever attempted this advanced training, but that does not necessarily prove that it is either undesirable or impossible.

Summary. (1) Since many processes and much of the knowledge learned must be reduced to the form of habit, and since the acquisition of skill is necessary, drill exercises with these ends in view are indispensable. The drill is essentially a habit-forming exercise. (2) Any subject which requires the learning of facts in definite form, the mastery of processes, or the acquisition of skill, involves drill. (3) (*a*) Motivation is necessary in drill not only to direct effort but to secure interest and attention. There are many sources of motives or reasons. (*b*) Definite understanding of what is to be done

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is the second step. (*c*) The third one is repetition with attention. No exceptions should be permitted until the new habit is established. (4) Attention is necessary in drill to avoid error, to shorten the time, and to increase skill. As attention weakens, it may be renewed by varying the exercise. The period should not be prolonged to the point of over fatigue. (5) Accuracy in the beginning of a habit is essential as first impressions and associations are apt to be lasting. (6) When accuracy is established, facility and rapidity should be sought. (7) Drill should be discontinued gradually and should not be dropped finally until proficiency has been attained. (8) Memorizing is fundamentally the formation of habit. It should be based upon understanding of the thought when possible. (9) In learning facts in a series, the series should be complete and the exact order should be followed. (10) The step of application involves drill to fix knowledge and increase skill in processes learned in the other formal steps. (11) Pupils, as they develop in intelligence and ability, should be trained in the process of drill until they can assume much of the responsibility for it.

REFERENCES: E. L. Thorndike, *Education*, chap. III, also chaps. VI and IX; W. W. Charters, *Methods of Teaching*, ed. of 1912, chap. XXIII; W. C. Bagley, *The Educative Process*, chap. XXII; S. H. Rowe, *Habit-Formation and the Science of Teaching*, chap. XIII; G. D. Strayer, *A Brief Course in the Teaching Process*, chap. IV.

EXERCISES

1. In a certain arithmetic, arranged on the so-called spiral plan, the same type of problem occurs on every tenth page, so that, in order to work ten examples in finding interest, the pupils must work through a hundred pages of the textbook. From the point of view of habit-formation, what serious defect exists in such a book?
2. Why should useful processes be made automatic?
3. Advance at least two arguments for the increase of skill on the part of a workman or artist.
4. Think over the way you work when you settle yourself to study

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a lesson. Could any of your studying habits be improved? Suggest how the old habits can be broken up and the better ones formed.

5. Sometimes the multiplication tables are mastered by sheer weight of repetition. Show how the instinct of play can be called upon so as to shorten the process?
6. Show how the spirit of competition may be used to bring about the formation of certain desirable habits.
7. We are told that we should examine subject-matter to discover the serial order of the facts which are to be memorized. Name such a series of facts from each of three subjects.
8. What habits must be formed in penmanship? In geography? In silent reading? In oral composition? In algebra? In physics?
9. The satisfaction which results from having performed a certain process correctly diminishes the number of repetitions necessary to make the process a habit. How can a teacher cause his pupils to experience satisfaction and so save time and energy in habit-formation?
10. What is the probable basis for the complaint made by teachers each autumn that their pupils must have been poorly taught because they do not know anything?
11. Pupils know that they must learn the multiplication tables, that they must learn to write and to spell. Why employ any other motive than this in making these processes mechanical?
12. How much drill should one employ in fixing a habit?
13. Young teachers sometimes continue drill until a process is perfect at the time. In a few weeks they are amazed to discover that the pupils have forgotten or have lost skill. What is the cause of such a condition?
14. Write a list of helpful suggestions for memorizing *The Children's Hour*.
15. Suggest two or three habits pupils should be taught to employ in connection with the meaning or spelling of unfamiliar words.
16. Give examples from experience or observation to show that repetition without attention did not increase skill or form the desired habit.

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XIII

SCHOOL EXERCISES WHICH INVOLVE REVIEW

What is meant by review

THE review exercise is assuming new meaning and importance in the school procedure of the present day. It is not many years since a review lesson was an exercise in which pupils passed a second time over subject-matter previously studied. Sometimes they re-read it; sometimes they answered questions at the end of the chapter, the answers being taken bodily from the text. The purpose of such exercises was to fix facts so firmly in mind that they would be remembered by the learner. We have come to regard these lessons as *drills*, since their function is to make certain associations habitual. The conception of the nature of a review lesson differs widely from this view once prevalent.

When ideas or ways of acting are recalled to the mind for the purpose of establishing new meanings, new relationships, or new ways of acting, we may be said to be *reviewing* our ideas or our modes of activity. Whereas in drill we seek to make automatic the connections already established between ideas, and the forms of conduct and ways of doing things which are already started, in review, we are looking toward the estab-

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lishment of new relations, the influencing of old activities or the beginning of new ones.

We establish new relations when we gather a mass of ideas about a subject into different groups, basing our grouping upon the meaning of the ideas or the use they serve. Thus we may review all the facts gained about New York City by seeking to form a classification, and may place in one group all ideas relating to occupations of the people; and into another group, all ideas relating to parks and museums; and so on until we have completed the classification. We also establish new relations when we gain new knowledge by means of knowledge already possessed. For example, upon the basis of our knowledge about angles, we build a store of ideas about triangles when we study geometry. To solve a given problem about triangles, we must review our knowledge of angles and select the relevant facts which apply to our particular problem.

People frequently employ a poor way of doing things because they have not made a connection between the form of activity in question and the knowledge they possess which might help them. In domestic science, pupils are sometimes taught how to wash dishes in a better way by reviewing the knowledge which gives the clue to the proper procedure. "What effect does heat have upon the yolk of eggs?" "Should one, then, use very hot water when washing dishes which have yolk of egg on them?" "What effect does

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cold water have upon grease?" "How about using cold or tepid water to get rid of grease?" "How hot should the water be when greasy dishes are washed?" In such lessons, established habits are altered through the review and application of previous knowledge. We sometimes insure the formation of right habits by getting the appropriate knowledge into mind in time to influence the first performance of the act which is to be fixed, as when, in physical training, the ideas in regard to the performing of certain movements are recalled and used as the basis for the development of new exercises.

When reviews are helpful and necessary

There is a fundamental activity of the mind involved in all review which we need to examine in order to determine when reviews are necessary. This is the process of correlation, the process of giving meaning to ideas through relating them to other ideas which have more or less meaning established. Thus something growing in a field is recognized as wheat because it is related to an established idea. Curiously enough, the "set" of the mind influences the associations made among ideas. A certain sound may be interpreted by one person as the unloading of coal, while another may interpret it as the grinding of stone for paving. The same sound may be given these two meanings by the same person at different times. On a winter morning he might think "unloading coal." If the street

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were being repaired, he might think "stone-crusher at work."

The point in what has been said is that we always make progress, gain meanings, and enrich experience upon the basis of the experience already possessed. There is very little time in our waking hours when we are not attaching meaning to ideas, hence correlation is a pretty constant process. Since education is a conscious attempt to reorganize experience, to build up knowledge, to influence intelligent activities and modes of looking at things, there must be conscious recourse to this process of correlation. That is, there must be effort directed towards influencing the associations made among ideas, so that knowledge may result and so that activities based upon knowledge may be assured.

In answer to the question, "When are reviews helpful and necessary?" the statement must be that reviews are necessary and helpful when the ideas which are to be the basis for understanding would not of themselves come into the minds of the pupils, or when these ideas might not come in such form as to make understanding ready and complete. Ideas might be recalled in part only, or they might present themselves in such disorganized array that they need to be put in order and freed from error. Review is necessary to insure the presence of the correct basis for the process of correlation. In any form of school exercise which involves interpretation of ideas, whether it be a proc-

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ess of thinking out the answer to a problem, or the application of ideas to some form of activity, review may be required. If we examine these exercises, some of the most striking occasions for the use of review will appear.

Suggestions for conducting review exercises

a. Review of old knowledge to form basis for solution of new problem. Instead of a review taking place at the end of a lesson exclusively, as is sometimes the practice, a lesson should frequently begin with a review. In the step of preparation, and often in the lesson assignment, the ideas related to the new thought to be gained and necessary to its understanding should be reviewed.

It has long been the practice of those who follow the Herbartian pedagogy to begin a teaching exercise by stating the aim of the lesson to the pupils. With this aim as a clue, the previous knowledge related to it is recalled, and, if need be made clear, and organized.[1] The necessity of having an aim is freely admitted, as is also the need of reviewing relevant experience; but the idea of having the teacher state the aim is not now generally accepted. The pupils can be made to feel a need for more knowledge or for a new form of skill by being made conscious of a lack in their own previous experience, and this shortage

[1] C. A. and F. M. McMurry, *The Method of the Recitation*, chaps. VI, XI.

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can be made apparent through a review. A feeling of need can be aroused for something which the review shows to be lacking. In a geography lesson recently witnessed, the pupils in summing up into organized form what they had learned in a previous lesson in answer to the question, "Why is San Francisco so important a city?" found that they knew that commerce is one element of importance, also that they knew many ports from which ships bring cargoes to San Francisco. They did *not* know, however, very fully or very accurately the nature of the cargoes. This deficiency of knowledge betrayed by the review, furnished the motive for a succeeding study period, namely, "What do the ships from Hawaii, the Philippines, and other countries, bring to San Francisco?"

With this aim established as a motive for a lesson, review might continue in order to bring to mind what the pupils know about the lands which trade with San Francisco that would enable them to work out at least part of the answer. Another review would also be valuable to call to mind the sources from which information bearing on the question could be obtained; also, the way to obtain the facts quickly from the sources named, that is, how to find quickly the chapter or map needed in the books named.

b. Review to discover whether all of the material concerned with a problem has been included and mastered. It has been shown that reviews are helpful in developing the aim of a lesson, in preparing the minds of the

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pupils for the solution, and in making prompt, accurate, and independent work possible. Reviews cannot be excluded from that part of the lesson in which knowledge is extended or new activities are learned; that is, from the presentation. One might liken the mind to a shuttle, weaving back and forth among ideas and making a fabric of them. To be thus related, it is necessary again and again to call up desired ideas. Experience is being reorganized and the parts to be affected must be brought to the mind's focus in order that they may themselves be altered, or that they may give meaning to other parts of experience. Review cannot be limited to the preparation or assignment. It is not accomplished once for all or in its entirety there. It often does not include all that is needed, and frequently it must be repeated during the course of the advance lesson.

A class began to work upon the problem, "Would the pupils of Old England who settled in New England feel at home in New England?" In preparation for the new lesson, various phases of New England were considered as that part of the subject had been studied. Little was known about England, but what was known was recalled and grouped under topics. In the advance lesson, information about England was sought for and as facts were gained they were grouped under appropriate headings. Point by point Old England was compared with New England to discover whether there were similarities which would make the

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settlers feel at home. Review in such an exercise meets one at every turn. "Certain conditions of soil and climate are found in England. What industries may one expect as the result of these conditions?" As simple and frequent a question as this cannot be answered without a backward mental look to find the foundation experience upon which to base the answer. We must, then, employ review frequently and wisely to insure a thorough presentation and understanding of the new lesson.

c. Review in application and drill. The old proverb, "Practice makes perfect," has of late years given way to the psychological maxim, "Repetition with attention makes perfect." Repetition corresponds very well with practice, but to what shall one be attentive? To a model or ideal of some kind and also to the work being done. We are dealing here with the foundation of habits or the increase of skill. The first step in such exercises is a clear idea of the thing to be done. This may be secured through presentation or through the recall of previous ideas. As the practice is to be accompanied by attention, by frequent comparison of the thing as it is with the model to be equaled, there is again a constant review of the model or ideal. This review not only influences skill, but it serves to fix the ideas recalled and related very firmly in mind. This statement would hold true of the ideas reviewed in any step of a lesson. The part of a lesson in which associations among ideas are made automatic, and

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in which activities are reduced to the stage of habit, is known as the application. Through it we seek control of associations and activities. As has been shown, it must be based upon the right idea and must frequently refer to this idea if results are to be satisfactory. Thus the child who tries to master long division must review again and again what he is to do as he works from one example to another. The student in manual training who is working from a drawing must at times refresh his idea of what is to be done by reviewing his plan. The art student or music student reviews constantly the instructions of the master when working for skill.

Training pupils into right ideas and conscious method of review

Review must be accepted, not only as an important, but also as an indispensable element in the various stages of teaching and of study as here set forth. It is essential in order that the student may organize his subject, and get a clear view of it in its proper order. In studying a book, it is often advisable to read a chapter through without stopping, in order to get the general line of thought. More detailed study may follow in order to discover the main points and the author's arguments for these points. As a test for himself, the student may lay the book aside, write the proper heading, and then outline the subject for himself, basing his organization upon his own view of the subject. This

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independent work is often a most valuable review of the author's work because it involves both agreement and difference, and that usually means a good understanding of the text. Material presented through a series of lessons in class should be similarly reviewed and organized to secure intelligent comprehension, and also to aid retention in the mind.

Pupils in the grammar grades, or high schools, as well as students in higher institutions, should, in order to get a thorough grasp of a given subject, bring it up to date, so to speak, by stating from time to time the main topics or subjects which have been covered in textbook study or class work. The whole plan of the work becomes clear, the relation of part to part is seen, relative values are established, and lines of independent thought and investigation suggest themselves. Such work throughout a term is much more valuable than a season of cramming at the end. It results not only in knowledge, but also in power to work independently and effectively.

General suggestions

a. The teacher's preparation for a review exercise. The teacher's preparation for a review exercise should be as carefully made as the preparation for any other exercise. The preparation itself must be a review on the teacher's part in order to determine what experience the pupils have had that will be helpful in the approaching lesson. The point of contact between the

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old and the new must be determined; and, since correlation depends partly upon the set or state of mind at the time the ideas to be considered enter consciousness, the proper background should be included in the teacher's planning. The success of any review exercise which is an important part of a lesson or series of lessons will depend largely upon the thoughtful preparation of the teacher and upon her foresight in creating the right attitude and spirit for it. It will be affected, too, by the spirit which the teacher brings to meet the class. With a teacher so steeped in formality as to belong to the type described by Carlyle as "dry-as-dust," a review is quite sure to be a perfunctory affair. Under the direction of a teacher who sees in it a means of mastery, of organization, and of furnishing the starting-point for new investigation, and who realizes the value of interest, a review may be a very profitable exercise, which, while it may be difficult, may at the same time seem worth the effort to those who engage in it.

b. The time given to review. Attention is called to the fact that reviews are often a part of other exercises, but that they sometimes form separate lessons. They may require only a few minutes of time, or they may occupy one or more recitation periods, — the latter only in the case of older students who need to review in order to organize their facts in regard to a large section of subject-matter. The time spent will depend upon the nearness of the material to consciousness,

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upon the amount of it, and also upon the amount and kind of organization which already exists. The material needed for a new lesson may have been so recently in mind and may be so interesting that a single sentence of suggestion may bring it to consciousness. The exact time needed cannot be definitely stated.

c. Profiting from reviews as tests. In the attempt to discover how effective the teaching has been, teachers and supervisors sometimes give tests or examinations to classes which compel the application of knowledge gained or habits formed. These tests thus constitute a sort of review. Frequently the percentages obtained by the pupils are averaged and a class standing is announced. If the average is seventy per cent, or above, the teacher is satisfied. Upon the class standing, whatever it may be, the supervisor rates the teacher's ability to instruct her class. Meanwhile, what about the gaps in knowledge revealed by the test? Suppose the class has been working with United States money, using the four fundamental operations. A test made up of four examples, one for each fundamental operation may be given. After the papers are corrected, whether the class average be discovered or not, a teacher should look over the papers to see how many and which pupils failed in the example in addition, how many in subtraction, and so on. In case the failure is due to some difficulty peculiar to reckoning with United States money, it should be discovered. The teacher will then know what no class standing can pos-

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sibly tell. He knows which pupils need aid, and also what aid they need. This knowledge justifies the test, and from it both teacher and class should profit in the teaching which follows. Similar reviews conducted in other subjects serve to improve the teaching because they reveal where expected results have not materialized, and where, in consequence, effort must be directed.

Summary. (1) The purpose of reviews is to establish new relationships among ideas by means of a basis in knowledge already possessed. Drill differs from review in that it seeks to fix relations already established. (2) Reviews are helpful in order to provide the proper mental attitude for apperceiving new ideas, in order to influence the association of ideas, and to determine activities based upon ideas. They are necessary when the ideas might not come into consciousness of themselves when needed, or when they lack organization and vividness. (3) They may form an element in any part of a lesson from preparation to application. They cannot be limited to any one part of a lesson, and are not completed once for all. They must be given as needed, whether to provide the problem or to organize the data bearing upon the problem. (4) Pupils should be trained to use reviews as helps in mastering subject-matter. To test mastery, they should reorganize material from a new viewpoint. To keep track of a series of lessons, or of the material given in one lesson, they should review the points from time to time and establish relationships. (5) The teacher should exercise foresight in regard to reviews, so as to create the right attitude for the lessons based upon them, and to insure their employment. They may otherwise be overlooked. Reviews may form a separate lesson, or may be a part of another exercise. They form excellent proofs of the kind of

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teaching which has been done. They often reveal the weaknesses and the ignorance which the teacher must overcome in later teaching.

REFERENCES: W. C. Bagley, *The Educative Process*, chap. XXII. G. D. Strayer, *A Brief Course in the Teaching Process*, chap. IX.

EXERCISES

1. Give two illustrations to show the difference between drill and review.
2. Explain how a review exercise may be a valuable examination lesson.
3. Show how in the history of the Civil War the organization of the subject-matter necessitates review.
4. In a geography exercise show how an aim or motive for a new lesson may be developed through a review of known material.
5. What, if any, review is necessary in answering the question, "Why does the United States not grant self-government to the people of the Philippine Islands?"
6. What connection exists between the process of correlation and review?
7. State all the reasons you can think of for reviews. Did you do any mental reviewing in finding these reasons?
8. When should reviews take place?
9. Is motivation necessary in reviews? Why, or why not?
10. How can pupils be trained to conduct their own reviews?

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XIV

TRAINING PUPILS TO STUDY

The nature of study

For many years, a common complaint urged by teachers was that their pupils did not study as they should. An investigation of the teachers' ideas as to how pupils should study revealed so much ignorance and difference of opinion on their part in regard to this very important matter that the criticism came to include teachers as well as pupils. Teachers in college classes must themselves be taught to study in some other way than memorizing more or less thoroughly the contents of a textbook and reciting them in answer to the questions asked by the instructor. In opening the discussion of the study lesson, it will be well, therefore, to review the steps which observation and reflection show to be necessary in study.

In a lesson in which habits are to be formed and associations so fixed as to function automatically, the steps necessary, as explained in the chapter on habit-formation, are: (1) a feeling of need which can be satisfied only by learning the habit in view; (2) a clear idea on the part of the learner of what is to be done; (3) practice. If in dividing by a decimal, pupils are to multiply both dividend and divisor by ten, one

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hundred, or some other number obtained by using tens as factors, in order to eliminate the decimal in the divisor, the idea of the process must be made clear to them; there must be attentive repetition of the process to insure mastery of the idea and to start the process correctly; the process must be employed until facility is assured.

In much studying, however, the work to be done is of a very different nature. In the various forms of teaching exercises described in this book, we have found the starting-point to be the realization of some need to be satisfied, some problem to be solved. This consciousness of an end to be reached is the starting-point of purposive, or logical, thinking. Since study in its higher form involves thinking, its beginning, also, must lie in the feeling of need, in seeing that some end not now present must be reached. In other words, study originates in the consciousness of a motive and this we call the first step in the process. In a city where the milk supply is found to be unsatisfactory, a discussion of that fact with its results might lead to the question, "What measures can be taken to insure sanitary milk?" Here is a problem as definite as finding the area of a triangle of given base and altitude, or reckoning the interest on ten thousand dollars for four years at five and one half per cent, or finding why the days and nights are so long in the polar regions.

With the mind directed thus definitely toward an end, other steps in the process of studying follow quite

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naturally. One begins to *guess* or theorize as to what the explanation may be. In other words, he makes an hypothesis. He collects information bearing on his problem. He may draw from his own experience, he may think out the answer, he may consult other people, he may read books, he may observe, or he may experiment. In the problems suggested in the last paragraph he may employ all of these sources in collecting the data needed to arrive at a satisfactory result. Many times, the thought material collected must be grouped into classes in order to bring out its full significance and to enable the learner to master his work in orderly fashion. Under the topic of sanitary milk supply there would be several large headings with various subheadings; e.g., milk-production, transportation of milk, distribution of milk, care of milk in the home, etc.

Frequently, too, in study it is necessary to examine data, whether in the form of book material or oral statements, with great care to see whether they are accurate and whether one may safely accept them. A certain well-known writer on physiology and hygiene purposely makes startling statements contrary to fact with the express idea of rousing people to thoughtful antagonism. Unless we are accustomed to exercising careful scrutiny of the facts bearing on our aim, we are likely to believe much that is, to say the least, misleading.

Another element in the right kind of study is the

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practice of not stating a final conclusion when the facts do not warrant one. Our best scientists frankly say, in regard to many of the problems with which they are struggling, "We do not as yet possess enough knowledge to enable us to state a positive conclusion"; or, "As far as we have been able to discover, the indications are that so and so is the case, but no one knows definitely." They are studying scientifically and they refuse to commit themselves to final conclusions until the evidence is beyond all question. This deferring of judgment is indispensable in accurate study.

But unverified and unapplied theories and solutions to problems are not final. They must be put to the test of use in either real or imagined situations to determine their adequacy to meet the difficulty or the need which started the studying process. At times, the experience of others in whom we have confidence is sought to learn whether their conclusions corroborate our own. For example, the student who has worked out an independent solution of a problem in higher mathematics consults the answer in the book, or else his instructor, to learn if he is right; or, having fixed upon a value for x, he tests it by substituting it to see if it satisfies the equation.

Frequently the results of study must be kept in permanent form, and the student is obliged to memorize what he has learned. This kind of memorizing differs from the type employed in learning to count, to

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say the letters of the alphabet, or to spell, in that it is based upon thought and is not mere mechanical association.

These factors of study — realizing a problem, formulating an hypothesis, collecting and organizing data, exercising doubt or maintaining independence in opinion, deferring conclusion, verifying and applying conclusions, and memorizing — may all be present in the attempt to meet some of the situations which demand study; at other times, such elements as the exercise of doubt, the deferring of judgment, and memorizing may not be necessary. Sometimes the whole process may require only a few minutes; in other problems, the studying may extend over a long period because the collecting of data may require prolonged inquiry, reading, observation, or experimentation. This, then, is the nature of study. The questions remain, What shall be done during a study lesson? and How may students be trained for independent study?

What may be done during a study period

During a study period a student may be occupied with one or more steps of the study process. He may enter upon the period with a clearly developed aim, or it may be a part of his work to discover the problem involved in the subject, whether it be found in a book or outside of a book. In a book lesson, he may be required to find the author's problems or to discover supplementary problems of his own. In some subject

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in manual arts or domestic science, the student may prepare a list of the questions involved. Furthermore, the study period may include any or all of the other processes, whether collecting and organizing data, verifying and applying conclusions, or memorizing. At some time or other, all of these processes will be employed as needs require.

A problem solved by a pupil is not always a problem in condition to be presented to the class. A pupil must, then, at times prepare the results of his labors so as to give them to his classmates and his teacher. He must have his material in order, his proofs ready, must think what he is going to say, and what illustrations he will use. He may even need to rehearse his lesson so as to present it well.

In his study a student may use books or other sources in his search for data. He may observe the phenomena about him; he may spend his time in thinking; he may be obliged to experiment; or he may need to consult other people. His procedure will vary with the requirements of his problem.

The nature of the problem may necessitate study outside of school hours, since some of the data must be studied elsewhere than in school. Some lessons must be prepared in school, since the books to be used are found there and not elsewhere, or because the work must be done with the teacher.

Some people in these days are raising a protest against home study. If study is a process of solving

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problems, and if the schools select the problems which are a part of the lives of the students, then home study is inevitable since home and community furnish both problems and the data necessary for their solution. Schools should be in very close touch with community life. The right kind of study will further this relationship since it brings students into interested, intelligent and coöperative contact with home and neighborhood.

The study devoted to the solution of problems may be either solitary or group activity. In experimental work, in the preparation of a debate, or in other phases of activity, several students may combine their efforts. A number of students may be given the use of a separate room, or even a corner of the classroom, where they may compare notes, divide the work to be done, organize results, and do whatever else is necessary in order to bring before the class the material for which they are responsible. Other study may be performed by individuals. It may, at times, be necessary to forbid consultation in order to insure proper study by all members of a class. In general our own experience as teachers should be suggestive to us. At times, we need solitude for reflection; again, we need to consult freely with others to learn what they know, to exchange views, to argue, to stand by our own ideas with proofs, to amend them when the evidence compels alteration, and to get the benefit that can be obtained only by bringing mind in contact with mind.

There will be many occasions when teacher and

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students will study together instead of having individual or group work. It will not be a crime, then, to look into the book. On such occasions books will be opened and all will work with them freely, because they are satisfying felt needs instead of reciting words memorized more or less thoroughly.

Training pupils for independent study

It is necessary to teach children to study properly in order that the fabric of knowledge may be influenced, that experience may be reorganized along right lines, and that their efforts may not result in mastery of words rather than ideas. We also need to train them in right habits of study in order that they may learn to work independently and scientifically in what they have to do. They need such habits in school, and they need them both as children and adults in the life outside of school. The teacher has no more important or worthy task than this one of training pupils to study well. How can he practice them in the various steps of study? This question would require a book for full answering, but some suggestions will be of assistance.

a. Training to find the aim or problem. Nowhere more than in the matter of training students to find aims or ends to which they should direct their efforts is the relation of good teaching to proper study apparent. Those taught will imitate the teacher's method of working, and they will prepare for the kind of recitation exercise which a teacher is known to conduct.

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If the teacher, when working with his class, habitually seeks aims, and sees the problems which swarm up in connection with every subject, the pupils will tend to follow his example. If, furthermore, when a recitation exercise is under way, the pupils are held to the presentation and discussion of important aims, pupils will study so as to meet this requirement. In these ways, then, by example and by requirement, as well as by teaching, pupils can be trained in good habits of individual study.

In taking up a new section of work in literature, geography, or history, pupils should be given training in class where the teacher can help in asking the questions which they think should be treated of in the new section. They should be given practice in turning to the textbook and finding one after another the questions which the author must have had in mind and which he has answered in the text. For example, the pupils may turn to the story of "The Fall of Troy." They may need help to find such questions as these: "How long did the war last?" "In what manner did the Greeks and Trojans fight?" "What plan was made by the Greeks to capture the city?" With the list thus started, the pupils may be required to find during their study period the rest of the questions answered.

In arithmetic problems, much difficulty arises because pupils do not clearly determine what they are required to do. They need to be held to definite word-

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ing of the thing required, first in class with the teacher, and later in the study period with other examples.

In nature study and constructive work, there should be reflection upon the problems possible. In a class which was to study about fish, the teacher suggested that inasmuch as people often keep goldfish, it might be well to study about them, and asked the pupils what they would need to think about if they had goldfish for pets. There was a goldfish in the room, and the pupils had been watching it for some days. There was no lack of questioning on their part as to kind and size of aquarium, what to put into the aquarium, the amount of water needed, how often to change it, the amount and kind of food, the diseases to be expected, how to overcome them, and so on until the list was long. In later lessons about animals, the pupils, after a lesson or two like this one, should prepare their own lists independently and bring them to class.

Since school life and community and world life belong together, pupils should be required to seek for aims in their reading and experience outside of school. "Why should a country concern itself over the rebellions which occur in some of the countries of Central and South America?" "Why are certain European countries at war?" "What is the Interstate Commerce Commission and what are its duties?" "What is the cause of a certain recent flood?" etc. The newspapers and the subjects of conversation in the homes should send pupils to school full of questions. But, strangely

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enough, the children in our schools must frequently be given practice in looking and listening to discover that here are things well worth their consideration.

Very often pupils are helped to find aims by suggesting to them some social service. "How can you help absent pupils make up the work they have missed?" "We are to give the assembly program. What shall we do to entertain our schoolmates?" A party is to be given by a class and the teacher asks, "What are the things we must think about and plan for in giving this party?"

If a teacher is never able to lead her pupils to suggest specific reasons for their composition work or their arithmetic, for history, geography, manual training, and for the other subjects, he either lacks insight himself into the nature and possibilities of his materials, or he is exceedingly clumsy in his teaching, because pupils often need no more than an opportunity to ask the questions which they are usually compelled to conceal in their own minds. They are unskilled because unpracticed. Both they and the teacher will grow in ability if the work be undertaken together. What is made clear in class in this direction should be required in individual study and should appear in the recitation lesson later. These aims can be stated and compared, the more important and more inclusive can be accepted, and the wording can be corrected as needed.

b. Training to judge of hypotheses. It is quite natural for people, when they find themselves in a difficulty of

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some kind, to cast about in their minds for a way out. This is what takes place when we are confronted with a situation which requires thought. We make up a working theory or hypothesis and then we try to use this theory in the solution of the difficulty. We can save trouble for ourselves by first considering whether our theory or hypothesis has any bearing at all upon our difficulty and whether it really offers a possible solution.

In the training of students in their use of hypotheses, it is not necessary to spend so much time and effort in trying to have them suggest theories as it is in having them examine their theories to see how relevant and adequate they are. Pupils are usually very willing to "guess" the solution, or cause, or effect, or way of working, or whatever is required; but the trouble is that the guesses are frequently wide of the mark. It does not mend matters much to dismiss these guesses as ridiculous and wild. Students must learn to see for themselves that they are so, and must reject or alter them. They must learn to criticize their own ideas and discover whether they give any promise of help.

The only way for pupils to learn this very necessary lesson is to be held to the criticism of their theories as they offer them to discover whether they bear on the problem at hand at all, and, in case they are relevant, to see whether they tend in the right direction. The pupil, who in answer to the question, "Why do oranges grow in Florida and not in New Jersey?" replied,

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"There are many alligators in Florida," could discover for himself that his answer had nothing whatever to do with the question and he should have been compelled to do so. Had he suggested difference of climate or soil, then he ought to have stopped to think whether those factors could possibly affect the situation. In case he decided in the affirmative, he would have been ready to proceed with his investigation to see if he was correct in his theory.

Professor Thorndike [1] gives the very helpful illustration of the boy trying to find his way to a certain house. At every cross or branch road, he must stop and think whether the path leads him to his destination. This is what children and adults must do when in study they are pushing forward to an aim. They must examine the paths to see if they lead to the desired goal. The teacher must by practice show students how to do this, and must both encourage and require them to practice the close scrutiny of their hypotheses whenever they use them.

c. Collecting and valuing data. In the chapters on "The Assignment of Lessons" and "The Recitation Exercise," suggestions are given for helping pupils to know the sources from which data bearing on the aim are to be found. In the early stages of teaching pupils to study, these sources will have to be brought to mind very clearly before individual search begins. Later, as pupils grow more skillful in handling books,

[1] E. L. Thorndike, *Principles of Teaching*, p. 150.

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and know better where to turn for materials, it may not be necessary to say so much about sources. The pupils in the higher grades of the elementary schools and students in high schools should know how to find what is in their textbooks, and also what the school library contains which is helpful in working up a given subject. They should also know how to use the public library quickly and advantageously.

In order to use books of reference profitably, pupils must learn to cull what they need at the time and disregard the rest of the material. They need not read the entire book, nor even an entire chapter. They must be held to seeing quickly, as they scan a page, what gives promise of help, and then to a closer scrutiny to determine the relevancy and value of the part that attracts attention. What is found may be relevant but not valuable. It may be valuable in some other connection but not relevant to the problem at hand. Through class practice, insight and skill in this quick search for, and evaluation of, material can be increased. Practice in individual study must follow to secure the best results.

The same standards must be applied to data gained from other sources than books. "Do they relate to the problem?" and "Will they aid in finding the answer?" are the tests for pupils to apply. Material which cannot stand these tests must be rejected, however valuable it might be in other connections.

d. Teaching to organize material. The place to begin

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training pupils to organize is in the primary grades where stories are told, games are played, and various activities are planned. When a story is told by pupils or teachers, the pupils should occasionally be asked to suggest a title. They can be aided to exercise critical judgment in regard to the titles suggested so as to choose one that is interesting, not too long, and that takes in the whole story instead of one incident. They can decide in telling a story what they will tell first, next, and so on, forming in this way, a crude topical outline which should grow in excellence from grade to grade. In plays and games, they can prepare a similar outline of the parts of their activity. In making some object, they can plan the various stages of their work, or, in reviewing it, can tell what they have done, step by step.

In the reading-lessons, in geography, history, civics, literature, and other similar subjects in which a thought is carried along through several paragraphs or chapters, the pupils, even in the third or fourth grade, can select the important topics dealt with in subject-matter suited to their development. By working with the teacher, they learn to word these topics smoothly, to make them interesting and suggestive of the thought, and to observe other standards which they help to establish through their own criticism.

This test is suggested for a teacher of a grade not lower than the fourth. Select some short interesting article from the newspaper, read it to the class, and

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ask the pupils to write a good newspaper heading for it. After three minutes, collect the written papers, which should include name and date, and file them. During the following week, talk with the pupils about good headings, and have them try to write some. At the close of the week, give a test similar to the first one, and note the improvement. It will be found that the pupils have set up standards of excellence in even so short a time.

It does not require many exercises with the class to train pupils to write paragraph headings and to find the leading points under their general subject. The results presented by various pupils will show differences, but that is not a fault.

This organization should be required in all subjects where material offers opportunity for thought mastery. It may require slow progress for a time, but it makes rapid work possible after a few weeks of practice. If the teachers in the primary grades will introduce it and follow it up, and if the teachers of higher grades will keep building upon the foundation thus laid, our school work will be revolutionized in the amount and quality of the results achieved.

e. Deferring conclusions and forming independent judgments. Recently a young woman student assured the writer that she positively knew that a certain plan of work suggested by another member of the class would not work. When asked for proof, she was obliged to acknowledge that she did not really *know*,

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but that it was her *opinion* that the proposed plan was not feasible. It was suggested that the way to find out was to try the plan with children and note results. This student was independent in her views, which was commendable; but she permitted opinion to take the place of evidence, which was not so praiseworthy. In this instance she should have deferred her conclusion until evidence enough had been obtained.

The case just cited is typical of many class situations. Students need to be held to the question, "Do we know enough about the matter before us to answer our question definitely?" They should be encouraged to take this attitude in class discussions and in their individual work. The questions of public interest discussed in the periodicals of the day afford almost constant occasion for suspense of judgment either because the information given is incomplete or is of doubtful authenticity. It would help pupils if they were to consider in class some of the news items from the papers and to discuss their probable value. The source must be considered; also the character of the paper from which the items are taken. In some matters, the proof must be weighed. Often the scientific accuracy of the authors consulted must constitute a factor in dealing with evidence. In reading historical novels or historical plays, one needs to keep these facts in mind. The author was not working for a scientific presentation but rather for a literary effect. His authority as an historian cannot pass unchallenged.

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Pupils sometimes have to be almost compelled to take note of the inaccuracies in the recitations of their classmates. They should frequently question statements made, should differ radically, and should see that conclusions are not justified because of lack of evidence. In these situations, the teacher so frequently does all the work that pupils learn to be passive. If permitted and aided, they will soon learn to watch the work of their classmates, to argue, and to maintain that conclusions are either incorrect or are based upon insufficient evidence.

In a class recently observed, a pupil stated that the rainfall of Germany is less than that of Great Britain, and that this fact gives Germany the advantage in the manufacture of cotton. Another member of the class at once opposed this conclusion with the argument that the greater amount of moisture is favorable to cotton manufacture, and that, therefore, Great Britain has the advantage over Germany. Here is a simple case of independent thinking and one that points the way along which pupils may be taught to work. They must watch the evidence and see if they agree with conclusions derived from it. They must examine conclusions and see if the evidence warrants them. They can do this in very simple matters, or, in advanced classes, they can consider situations which are complicated and obscure.

f. Testing conclusions. When a problem in algebra is solved, the student does not stop until he has sub-

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stituted the value of x to see if it satisfies the equation. If it does, he is content; if it does not, he must examine his procedure to determine his error. The test of his result is found in its application. So the pupils must do with their reasoned-out theories in other directions. They must apply them to real or imaginary situations to see whether they will meet the difficulty. Pupils who arrive at the conclusion that winds blowing from the ocean are rain-bearing winds, while winds blowing from the land toward the ocean are dry winds, should not let the theory pass without finding out in some way if it is correct. They may do this by referring to conditions in regions with which they are familiar. They may also do it by referring to the maps in their geographies which show winds and rainfall. Theories unverified, untested, are of little more value than opinions.

As has just been suggested, verification may be obtained by comparing one's results with the textbook. The answer in arithmetic is usually verified in this way. Causes and effects in geography, history, and science may also be verified by reference to the text. Sometimes verification comes through comparison of one's conclusions with those obtained by others, or by reference to the experience of others. The teacher may often stamp conclusions as right or wrong by pointing out the situations to which they will or will not apply, or by showing the strength or weakness of the train of thought which led up to them.

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The pupil can be helped to become independent in this process of verifying and applying his results by being shown how to do it and then being obliged to use the step. How can you find out if your answer is correct? Where will you look for verification? What people can tell you whether you are right or wrong? What experiment will prove your answer? If your theory is correct, what facts will it explain? These are some of the questions which will help pupils in the testing of results. They ought, after some training, to ask the question best suited to their own particular problem and then work along the line of the answer.

g. Thoughtful memorizing. Memorizing that is based upon the thought content of subject-matter rather than upon the order of words is called thoughtful memorizing. An exact order of words may be learned, as in poetry, definitions, and rules; or the questions studied, the main points made in the answers, the order of the steps in a chain of reasoning, or the nature of the verification may be learned so as to be remembered, even though the wording may not be fixed. Both kinds of thoughtful memorizing are necessary at times in order to preserve the results of study for later profit or pleasure.

In either case, the place to begin is with the consideration of the ideas presented. In the course of class study or individual work, through processes already described, the thought is gained, the author's questions and his answers to his questions are sifted out of

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the text, the steps in a process of reasoning are worked out, topical outlines are prepared, and other kinds of work are done as the material demands. In the study of art and literature, points of excellence, of strength, of delicacy, and the like are brought out and enjoyed. There is thoughtful work, enjoyment, appreciation throughout. Then, in order to keep what should be retained, a definite effort must be made to memorize. The greater the interest and the understanding connected with the preceding study, the less the amount of drill required.

Since memorizing is one kind of habit-formation, the steps which belong to the latter process apply to it as well. There must, first of all, be the clear idea of the thing to be memorized, and there must then be enough attentive repetition to fix it. Attention not only insures accuracy, but it greatly shortens the amount of time necessary to memorize. Thoughtful study of the facts to be remembered should provide the clear idea. Thoughtful repetition must follow, and must continue at intervals until the end is accomplished. After studying a section of subject-matter, the pupils should be shown how to recall the questions they have found and the way in which they were answered. *Verbatim* reproductions are not necessary, since the thoughts in this case are more important than words, and exact wording is not essential. They should also be given practice in class in recalling the points made in handling the subject and in stating the results. With the model

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given them, they should be required in recitation periods to present results which have been prepared in this way. This will necessitate the proper use of the memorizing process in their individual study. If the teacher persists in calling for important ideas contained in the lesson studied, and for parts which are considered especially valuable, with the reasons for the choice, the students will feel the spur of necessity in preparing for such recitation periods and mere rote learning will be broken up. Another consideration is that they will enjoy such preparation more.

When lessons or parts of lessons are to be learned exactly as they stand, there should again be the idea of meaning preceding the learning, and the selection should be memorized by thought units instead of by lines, verses, or stanzas. The repetition should follow with close attention and with the effort to cut the process of memorizing short. If need be, there should be a time competition in order to hasten the process. The teacher must gradually accustom the pupils to taking care of this process for themselves. In intermediate grades the pupils ought to know the steps in the memorizing process, and they ought to be exercised in their use with the idea of making them proficient. It must be remembered, however, that it is necessary to recall from time to time what has been learned, the intervals between the drill periods becoming gradually longer. A thing once learned does not always stick in the mind. It requires several renewals to insure per-

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manency. One of the most serious defects in inexperienced teachers is their failure to recognize this fact. They prepare and conduct a fine development lesson, and because of lack of later attention, the results are lost to a very large extent. People must frequently remember ideas and they often need exact verbal forms. (We should therefore train our pupils to retain what is worth while in their school studies and train them also in sane and economical ways of committing these valuable parts to memory.)

Suggestions to the teacher

In order that pupils may know how to employ the various aspects of thoughtful study when they work alone, (it will be found advisable for the teacher to work with them in class, going through the actual processes, using textbooks, reference books, and whatever else may be necessary.) When the model has been given and the students have the right idea, then assignments should be made which will involve the use of the processes thus illustrated.

One attempt to employ the right method of working should not end the matter. Thoughtful study is constantly necessary; therefore there must be persistent and repeated effort along this line. (Pupils should report not only upon the results of their study, but also upon their ways of working so that wasteful and inaccurate methods may be eliminated and better ones substituted.) The pupil who has succeeded should tell

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how he worked for his material. His success should encourage others. Those who have done poorly need investigation so that the cause of their failure may be found and eliminated. The work cannot be done in a week or a term, though the faithful teacher will accomplish enough in a few weeks to reward her endeavors.

The training of pupils should begin with simple material and with easy requirements, — both as to kind and amount of work. If the problem is to be found in the text, a selection should be chosen for beginners in which the problem is easily discovered. If there is to be organization, the amount of materials should be limited at first, and the main points should not be too obscure. The teacher will find it necessary to choose from textbooks and reference books the most suitable material. In stories of inventions and discoveries, in accounts of famous men, in historical narratives some excellent selections can be secured for the purpose of training in study. As pupils grow more mature, or as they grow more skilled in their ability to study, they can work with much more difficult material, because they grow more competent to find the salient points and to disregard the unimportant. They grow in ability to cover ground and consequently can take longer lessons. The teacher is cautioned not to push the work too fast at first. If he tries to introduce this work in every lesson every day, he will cause some pedagogical fatalities, and may end with abandoning the whole plan as a failure.

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In the recitation period, the pupils must be held to the method of procedure put before them in the assignment, because pupils will prepare the kind of lessons that they know will be called for. Unless the teacher is consistent in following up the assignment, pupils will prepare their work in the same thoughtless, unproductive way to which they have grown accustomed.

As a matter of economy of time and efficiency in their work, pupils must be taught how to use book helps, such as tables of contents, indexes, the dictionary, the card catalogue, the literary index, and the encyclopædia. The use of part of these helps can be learned through explanations and drills in class. For library helps, classes can frequently be taken to a neighboring library, where either the librarian or an assistant can show the children where the various helps are located and how they should be used.

Testing classes and teachers

Supervisors will find it rather an easy matter to test the advancement of pupils and the quality of the teacher's instruction in the matter of study. A few tests are suggested herewith.

An example in arithmetic can be written on the board or slips containing the example can be given to the members of the class. At a signal the class begins to work according to the directions on the slip which call for these facts: (*a*) What is required? (*b*) What is given? (*c*) How should the example be worked? When

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all have finished who can do what is asked, the papers can be collected and quickly sorted into groups according to grade, — e.g., A, B, C, or D, — and the number of pupils belonging to each grade noted. The papers should be left with the teacher as a basis for special work with those pupils who need it. Later tests of the same nature will show whether the teacher is making progress with her class.

A short story may be read, and the pupils asked to write a title. The papers can be collected, sorted, and rated as above.

A selection from some text can be read and the pupils required (*a*) to write the author's question, and (*b*) to write the answer. These papers can be collected and rated.

Typewritten or printed slips containing suitable subject-matter can be given the pupils who are then directed to write the heading and the main topics. These papers, as in the case of the others, can be collected, sorted and rated.

If the supervisor or examiner desires, a time limit may be set to these tests. When the time has expired, the pencils should be laid down at once and the papers collected. If the pupils have, in advance, written the date and their names, the papers can be used to refer to later to note progress or to show the teacher which pupils need help.

Other tests may be devised to test progress in the use of other steps in study as well as in knowledge of

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subject-matter. Those suggested above have been tried and found practicable. Pupils in the fourth grade and in all higher classes should, after a few weeks of training, be able to read silently a selection of several pages of material adapted to their development and interests, write the subject, the main topics covered, the questions which they would like to have answered about matters suggested by the text, and also a list of words the meanings of which they need to know to understand the thought of the selection. They should do this in a period of not longer than twenty or twenty-five minutes. Fourth grade pupils have gone through such tests with success, thus demonstrating the ability of pupils to work independently, thoughtfully, and quickly.

REFERENCES: F. M. McMurry, *How to Study and Teaching How to Study;* L. B. Earhart, *Teaching Children to Study.*

EXERCISES

1. What would be the value of giving a class in arithmetic such exercises as the following and requiring them to make the problem? A man received an income of $2000, and paid $300 for rent, $25 for taxes, and $50 for life-insurance.

   A boy brought a quart of milk for ten cents and gave the storekeeper twenty-five cents.
2. What would be the gain to a class of occasionally reading the arithmetic examples one by one, stating what is given, what is to be found, and the correct way of working, without stopping the class exercise to perform the actual operations?
3. Since minds work according to natural laws, why train pupils to study?
4. Is telling or showing the better way to make clear to pupils the way to study? What suggestion to the teacher is involved in your answer?

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5. Is it always necessary for the teacher to help the pupils become conscious of the aim for which they should work? How else can they get their aims than by the teacher's aid?
6. What aims can little children have in their first reading lessons?
7. What aims are possible for oral and written composition?
8. What opportunities exist in connection with the great European war of 1914 for training pupils to defer judgment and to question statements?
9. If a fifth grade class is to use reference books, what preliminary help should it have? How much help should an eighth grade have that has been trained throughout its school course in habits of independent study?
10. Under what circumstances would you accept a clumsily-worded aim or topical outline from a class in preference to furnishing a perfect one of your own composition? How can pupils be helped to improve in this respect?
11. When pupils recited lessons from memory, the use of the text-book in class was forbidden. Show how using the book in class is an aid, possibly a necessity, in thoughtful study.
12. What can be done about the application of principles which pupils work out in their study of morals? What difficulties are in the way?
13. What is the effect upon the work of pupils when they know that not only the teacher but their classmates as well will call them to account for inaccurate or obscure statements?
14. What effect does it have upon a class to throw upon it the responsibility for asking questions and for checking mistaken answers?
15. Suggest how home-environment can be utilized in connection with some of the factors of study such as motivation, collecting data, and application.
16. What arguments can you advance in favor of studying the meaning of a rule, definition, poem, or other piece of subject-matter before memorizing it?
17. Prepare an examination in arithmetic and one in history which will test the ability of the pupils to do thoughtful work.

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XV

MAKING LESSON PLANS

Why a lesson plan is necessary

A LESSON plan is the preparation made by a foresighted teacher to be used as a guide in teaching. It is as necessary for the teacher to make this preparation as it is for a general to plan his campaign, for the engineer to plan his bridge, or for the merchant to plan for the trade of the coming season. The plan directs effort so that desired results are sure to follow, and to follow with economy of time and effort. It makes it more likely that the teacher will include all that should be taught in connection with a given topic; also, that procedure will follow the lines that it should and will not wander far afield. It is one of the marks of distinction between people in the state of savagery and people who are civilized that the latter exercise foresight and plan for the future to a much greater extent than the former. This procedure enables them to achieve results at which people less thoughtful can only marvel.

A teacher's task is highly complicated. In the first place, a prescribed course of study for his grade must be completed within a term. In the second place, there is a group of pupils of a certain stage of development, and possessing varying amounts of experience

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who must be brought into contact with this course of study in such a way as to master its values. If the teacher does no more than see that the subject-matter is memorized, or told in the pupils' language, a certain crude planning must occur to make sure that the specified course is completed within the given time. If, however, the course of study is to be used as a means of influencing the experience of the learners, is to result in knowledge, attitude, conduct, or skill, there must be planning which considers much more than the subject-matter prescribed by the school authorities. There must be definite recognition of those who are to be taught.

What a plan should include

It is likely to be a teacher's first thought that a plan should indicate the subject-matter to be presented to a class. It should show this, but it should show other matters as well. Following is a list of the things which a complete plan should contain: —

a. Subject-matter.

(1) The specific purposes to be accomplished through the subject-matter included in the plan.

(2) The subject-matter as a whole or in outline perspective.

b. Class procedure.

(1) The development of the pupil's aim.

(2) The method of treating the subject-matter.

(3) The provision for reviews, summaries, drills, and assignments.

(4) References and illustrative material to be employed.

(5) The verification and application.

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This outline of a plan may appear formidable at first, but a careful examination will show that it requires only that which a teacher must think about if the work is to be done thoughtfully; also, that after the learner has grown accustomed to this careful preparation, there will be very little that must be written in the preparation of a plan. Let us take up the items one by one and see what they require.

The specific purposes to be accomplished through the subject-matter included in the plan. The specific purposes are often called the teacher's aims. They indicate that in planning any lesson, the teacher has aims in view which the subject-matter of the plan alone can accomplish. Thus, in teaching about "The Gleaners," the specific purposes might be to lead the class to see Normandy peasants harvesting as Millet saw them, to share his feeling about them. In teaching "Lines to a Waterfowl," the purposes might be to see how and what Bryant was led to think of his own life in relation to Divine Power; also, to enjoy the beauty of both thought and language in this masterpiece. In a grammar lesson, the purpose of the subject-matter employed may be to show that a verb must agree with its subject in person and number; in geography, to explain why the corn belt is located where it is; in arithmetic, to show that the number of decimal places in the product equals the number of decimal places in the multiplier plus the number of decimal places in the multiplicand.

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The purposes to be worked for are along the lines of the aims of education in general. That is, the purpose may be to increase knowledge. Most of the aims suggested in the preceding paragraph have this function. Another purpose is the influencing of feeling, the arousal of appreciation. This is one of the aims stated for teaching "Lines to a Waterfowl," namely, to enjoy the beauty of both thought and language in this masterpiece. Still another general purpose is to increase skill or to form habits. In a lesson plan, such a purpose is made specific by stating just what is to be done in a given lesson. Thus, in a penmanship lesson, the purpose of the teacher may be to improve the formation of the capital letter *A;* or, in an art lesson, to show how trees look against the sky in winter, or how the use of a darker shade on a lighter one makes work more effective.

It is a common lack in teachers that they do not determine in advance of their recitations just what is the specific function of the subject-matter to be employed. They accept a course of study, or a specified textbook, and work through from start to finish without seeing just what each section of material can be made to render in the way of service. They will teach lesson after lesson "to increase the appreciation of literature," but unless they find just what is to be appreciated in each selection studied, they are quite sure to fail in the general purpose. It ought not to be possible to use the same statement of purpose for

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many lessons. Each one has or should have something which is peculiar to itself and which cannot be transferred. This the teacher should discover and utilize.

The subject-matter as a whole or in outline perspective. In some lessons, especially in primary grades, only one fact is taught, as when we teach that $3+4=7$. Again, the material possesses no logical sequence which one needs to put in outline form; for example, the reading lessons in primary grades. In plans dealing with such subject-matter, no outline showing the structure of the material is necessary. In most plans, however, several phases of subject-matter must be indicated, that is, there must be an outline showing its organization. Even the simple poems of childhood have clearly marked steps which should be noted. Just as pupils need to organize their data so as to master it and to make a good report to the class, so the teacher needs to organize his subject-matter so as to master it and to prepare to teach it properly. In order to present the subject of what a lesson plan should contain, the author has organized the subject under the general heads (*a*) *Subject-matter, and* (*b*) *Class procedure,* each of these topics having several subheads. This arrangement shows the structure of the material and makes possible a complete and orderly discussion.

An outline should follow the logical order of the subject-matter, that is, the order of dependence or natural sequence. If one were to teach the manufac-

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turing industries of England, he would, according to the order of dependence, arrange his topics as: (1) Natural features which make manufacturing possible. (2) What the manufactures of England are. (3) Where these industries are located; and so on. In history, the chronological order may be followed, when there is no logical relationship. Whatever the order, the arrangement of the topics should give a perspective of the ground to be covered. Furthermore, the teacher will find it helpful to include no more ground in one plan than can be covered by a brief outline, because this outline should be kept clearly in mind during the teaching process for which it forms the basis. It is to be the teacher's guide and therefore ought to be present constantly. A few large points can be held firmly when many small ones would defeat the very purpose of the separation of the material into parts, that is, mastery.

The development of the pupils' aim. When the teacher has decided upon the specific purposes to be accomplished through the subject-matter, and has analyzed the latter into large units so as to obtain a good perspective of the whole, as well as a convenient working basis, the actual class procedure must be definitely provided for. The point of departure here is the point where the subject-matter closely touches the interests or need of the pupils, that is, what some one has called the "point of contact." The place where need or interest focuses may not coincide with the first

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topic in the teacher's logical or chronological analysis, but it is not necessary or obligatory that it should. The teacher's outline of the Revolutionary War might begin with "Causes," while the interest of the pupils might center upon some of the activities or consequences of that war. The teacher's outline of California might have "Location" for the first topic; the point of contact for the pupils might be the fact that some of their friends spend the winters there, or the fact that much of our fruit comes from that State. Where interest centers, or where a need can be brought to the focus in such a way that pupils can be made conscious of it, there the pupils' aim must be located. The plan should show briefly what this point in the subject-matter is and how the teacher intends to make the pupils conscious of the end for which they are to work.

Many lessons begin without any consciousness on the part of the pupils of any aim whatsoever. Sometimes the teacher sets up an aim for the class. As has been shown in the preceding chapters, as well as in recent books on teaching pupils to study, it is possible and advisable to get pupils to state their own aims, or for the teacher to relate his statement of aim so closely to the knowledge and interests of pupils that the latter can instantly adopt the teacher's aim as their own. This does not mean that the teacher is habitually to establish aims for pupils. Such procedure marks the unskillful teacher. Reflection upon what pupils know and are interested in will reveal a basis closely

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enough related to the subject-matter to be taught to furnish the starting-point for its treatment. The plan should show how the teacher intends to utilize this old knowledge or the interests of the class so as to lead the pupils either to state the aim themselves or to accept the teacher's statement of it. In the illustrative plans shown later, this procedure will be made clear.

The method of treating the subject-matter. It has fallen to the lot of the writer to examine many hundreds of lesson plans prepared by students and teachers. A very common fault in these plans was the inclusion of every item of subject-matter instead of a mere synopsis or outline, and, on the method side, the writing of scores of questions to cover every item of the subject-matter. Such plan-making is burdensome and useless. Probably no teacher is ever able to follow such a plan in practice because pupils do not answer in the ways expected when such plans are prepared. The teacher is soon thrown off the track and the teaching procedure limps along to a sorry conclusion. It would be better far to prepare an outline or synopsis of the material to be taught, starting from the pupils' aim, and arranging the items in the order in which the pupils are likely to come to them from that starting-point. This gives the so-called psychological arrangement of subject-matter. It may not follow the order of topics in the teacher's preliminary survey but it will cover all the ground of the latter. It will probably be much fuller than the teacher's outline, though the

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teacher is cautioned not to make it a miniature textbook.

While the plan, on the subject-matter side, should give the material in condensed form, it should, on the procedure side, indicate how the pupils are to be brought in contact with the material indicated. As has been suggested, detailed questions are a waste of labor. If questions are to be asked, only those should be given which from time to time direct the thought forward. These questions will correspond to the main topics of the outline of the subject-matter and may be placed beside them on the page, each question being opposite the topic which it introduces. If pupils are to recite on prepared topics, or read assigned references, the plan should show these facts. If they are to consult textbooks, or if they are to reason from one conclusion to another, the plan should make provision for such procedure. In short, the teacher should make clear how he expects the pupils to get into their minds the matter which he plans to give them. If it be by developing questions, by observation, by experimentation, by reading, by telling, or by some other method, the plan should show that the teacher has anticipated his procedure and has made arrangements for it. A teacher is sometimes confused if the supervisor says, "Your subject-matter is well outlined and your questions are good; but how do you expect your pupils to gain the answers to your questions?" This important detail should not be overlooked.

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The provision for reviews, summaries, drills, and assignments. Frequently during the teaching of the lesson or series of lessons needed to cover the subject-matter of a single plan, it is necessary to introduce reviews and drill exercises for the purposes which these alone can serve. Also, during the progress of teaching, questions may be expected to arise which will form the basis for later recitations and which should be definitely assigned for study. The plan should make provision for the necessary reviews, summaries, and drills, and for the assignments which grow out of the lesson.

References and illustrative material to be employed. The tendency to refer to other books than the pupils' textbooks and to employ illustrative material freely is growing rapidly in these days of libraries and museums and of appreciation of a community's resources. When a plan is to include references, the title of the book or magazine, the volume, and the page should be indicated. While a plan will probably never be used a second time just as it was the first time, the references which the teacher has employed may well be used again, and should therefore be preserved in a way that saves searching for them in a library the next time they are needed. Then, too, it is often necessary to give the references to the pupils for their use, and it is well to have them in such form that they can be given promptly and fully. For similar reasons, it is advisable to include mention of illustrative materials such as maps, charts, drawings, models, pictures, and

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the like, from which pupils are to learn any of the facts of the lesson. The instructor is well fortified for his work who definitely plans for these aids to his teaching.

Verification and application. No lesson which has for its purpose the solution of a problem, the mastery of a process, the elimination of a difficulty, or the satisfying of some conscious need, should be concluded without definitely referring to this motive, problem, or need to see how it has been satisfied through the lesson just given. "What did we start out to do?" "How have we done it?" "Does this meet the difficulty?" These are some suggested tests to be applied to the results of the work provided for in the plans. If the aim of the pupils was to learn how to copy numbers rapidly, they should at the end of the drill exercise recall this aim and state the means they have employed to accomplish it. If the aim was to find why General Burgoyne failed to complete his part of the British plan to gain possession of the Hudson River, the question and the answer should be put together at the close of the lesson or series of lessons in which the answer was found.

Rules and definitions should be tested by employing them in the original situation from which the aim was derived. They should also be verified by reference to books or other sources. Processes can be similarly checked to see if they are accurate.

It frequently is the case that results obtained in lessons are to be made automatic. Rules must be applied

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and processes repeated until they become habitual, — until mastery is assured. Results must, at times, be memorized. Plans are not completed until definite provision has been made for testing, verifying, and applying results, or for memorizing that which is to be retained in definite form. This provision need not occupy much space in the plan, but the fact that it is there, even in brief form, means that the teacher has not overlooked this very important part of his teaching. The step of application, the last of the five formal steps, has its place in this part of the lesson plan.

Teaching from the plan

A lesson plan may be a help or a hindrance to a teacher, according to the way it is used. If the teacher, with plan-book before his eyes, follows it closely, disregarding the state of mind of his class, the questions asked, the unexpected knowledge or ignorance revealed, his plan has been an obstacle to good, live teaching. If, on the contrary, the teacher fixes in his mind the ends he desires to reach, the place where the class is to begin, the large points of his outline, and the few questions which are to direct thought, he can, to a great extent, disregard the plan book and work face to face with the class, following the bendings of the pupils' thinking, and recognizing the value of the contributions made. He knows where he intends to go and the general direction in which he must travel. These basal ideas will keep him from going far astray,

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and they leave him free to make the lesson live and interesting instead of dry and formal. He will need to consult his plan in order to give references and assignments exactly. He may need to consult it sometimes to see if he is overlooking some part which he intends to teach, but he should not follow it slavishly because that is deadening and never leads to independence and power.

Some considerations in plan-making

a. Impossibility of complete plans in all subjects. Such complete plans as have been described in this chapter cannot be prepared in all subjects for every day. No teacher has the time and strength to do that amount of work. Pupils in training in normal schools will need to spend a great deal of time in plan-making because that is an important part of the process through which they become skilled teachers. As mastery is gained in handling subject-matter and pupils, the amount of planning can be decreased. The teacher in charge of a class, and responsible for it, should first examine the course of study with care to see what ground is to be covered in a term. The work to be done should be broken up into units and an estimate made of the time to be given to each. Plans more or less complete can then be prepared for each unit. From day to day sections of these unit plans will be employed in teaching the class. This way of dealing with the term's work enables the teacher to keep his bear-

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ings, to see the place of each unit in the whole body of subject-matter; and it also secures a better distribution of time than is likely to result if there is no preliminary division of time.

b. Learning to shorten the process of plan-making. Since good teaching demands planning, and since it is out of the question for any teacher to make detailed plans every day, the question arises, How can the process of plan-making be shortened to working proportions and still result in efficient work? A teacher should school himself to master his material as a public speaker does his. It is a common experience for a lecturer or speaker to write out every word of his address when he first begins such work. He covers the ground with care, but loses something of personal touch with his audience. With effort he trains himself to speak from a mere outline of topics which he keeps before him. With further training and growing confidence, he finally masters the outline, and without notes faces his audience and delivers his message. The teacher should work for similar power in his own particular field. Complete plans are necessary until technique improves to the extent which renders detail unnecessary. The plan should presently simmer down to the statement of the teacher's aim or aims, the pupils' aim, the few large topics of the subject-matter, and the questions which introduce them. The references will also be needed. In the end, even this amount of writing may not be necessary. The writer has seen splen-

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didly planned lessons given when the only writing in evidence was the list of references on a small card. When plans are required by a supervisor or principal, a little writing will suffice to show the teacher's aim, the pupils' aim, the main divisions of the subject-matter, the few large questions, and the references. In the case of a strong teacher no more is necessary.

c. Complete plans necessary at times. When a teacher's work shows that his preparation is incomplete, a supervisor is justified in requiring fuller evidence of preparation than that just recommended for able teachers. Furthermore, even a successful teacher will find it necessary to fall back upon detailed planning when new material is undertaken in the usual grade, or when a higher class is to be taught. There are new elements introduced here which necessitate more forethought and more writing of plans. Then, too, even in the accustomed grade and with familiar material, the teacher will find himself kept in good pedagogical form if he now and then writes a complete plan. Such effort not only prevents backsliding, but makes for progress in efficiency of teaching.

d. Making plans cannot safely be discontinued. Planning can never safely be discontinued. It has been one of the drawbacks of education that so many teachers have faced their pupils day after day with no preparation and no definite idea of what they intended to do. They went to school in the morning and things simply happened in succession. Progress was largely

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accidental. To remedy such conditions, plan-making is necessary. On the other hand, a teacher who has so thoroughly mastered the work of a given grade that he can see nothing new in it which requires fresh effort on his part should ask to be transferred to another grade. He has become stale in the place where he is and his class is sure to suffer.

Summary. (1) A lesson plan is necessary in order that the desired results may be accomplished surely and economically. (2) A plan should show the specific purposes, the subject-matter in large perspective, and the proposed method of bringing the pupils in touch with the subject-matter. It should indicate the references and illustrations to be employed; also, the provision for verification and application. (3) Under specific purposes should be indicated what is to be accomplished through the subject-matter of this particular plan. (4) Through the outline from the teacher's point of view should be shown in a few inclusive headings the subject-matter in the order of dependence, or in the chronological order. (5) Under class procedure should be shown how the teacher expects to bring the pupils' aim to the consciousness of the pupils; also, the statement of that aim. Following this should appear the arrangement of the subject-matter as the pupils are to approach it, together with the questions which will introduce the main points and direct the thought forward. In this part of the plan should appear the provision for reviews, summaries, drills, and assignments, the references and illustrative material; also, the provision for verification, application, and memorizing. (6) In teaching from a plan, a teacher should use it as a guide and not be a slave to it. He should have the main points in mind, and should refer to the plan as little as possible. (7) Under general considerations, it is suggested that

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the making of full plans is part of the process of making teachers; that teachers in charge of classes should divide the term's work into large units, and deal with these units in their plans; that they should gradually learn to condense plans; and that they should finally learn to carry the plans in memory excepting the few details which need to be used for reference. It is suggested that plan-making can never be safely discontinued, and that even strong teachers are benefitted by preparing complete, detailed plans occasionally. Teachers who are shirking should be required to do so.

REFERENCES: C. A. and F. M. McMurry, *The Method of the Recitation*, chap. XIV; W. W. Charters, *Methods of Teaching*, chap. XXV; G. D. Strayer, *A Brief Course in the Teaching Process*, chap. XVI.

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APPENDIX

SUGGESTIONS FOR LESSON PLANS

I. The topic.
II. The teacher's aim. (A specific statement of the responses of knowledge, attitude, feeling, action, conduct, or skill which the teacher intends to secure.)
III. Brief analysis of the topic, showing the principal things which must be known or done in order that the teacher's aims may be accomplished. Only the most important points should be given, and these should be arranged in logical order when such an order exists.
IV. Procedure, and the psychological arrangement of the subject-matter to be taught.

Subject-Matter	*Procedure*
1	1
Former ideas and activities which serve as an introduction to the new topic.	Questions, conversation, or review of former activities to help the pupils recall or reorganize previous ideas or experiences which are necessary as a basis for the new knowledge and which pave the way for its introduction. This preliminary exercise should lead the class to desire the new work and to appreciate its value, and out of it should come the aim as stated by the pupils.
2	2
Organization of the knowledge or experiences which constitute the subject-matter of the new topic. The material should be arranged in detail in topical form, and in the order in which it will probably be taken up; i.e., in psychological order rather than in logical order. The books	The teacher's procedure in causing the class to gain or organize the new knowledge or experience the new activity. It should include the pivotal questions which introduce the main topics as indicated under *Subject-Matter* 2. It should show what illustrations, illustrative

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to be used should be named and the pages given.	materials, and motor activities the teacher will employ. It should indicate, also, the place and nature of the summaries, reviews, drills, and assignments which occur during the development of the topic.
3	3
Statement of the results which the teacher expects in the class as a consequence of the treatment of the new topic. — (See under "The teacher's aim," above.)	Means by which the teacher proposes to test the accomplishment of the aim. Questions may be asked or topics assigned which involve the use of the new knowledge in some other relation than the one employed in class. The use of the ideas may be shown in the execution of some constructive work or in some social activity.

REFERENCES: McMurry, *The Method of the Recitation*, chaps. VI–IX and XIV. Bagley, *The Educative Process*, chaps. XIX–XXII. Thorndike, *Principles of Teaching*, chaps. I and X. Strayer, *Syllabus of a Course on the Theory and Practice of Teaching in the Elementary Schools. Teachers College Record*, January, 1903, p. 60. McMurry, *How to Study and Teaching How to Study*. Earhart, *Teaching Children to Study*.

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LESSON PLAN IN READING FOR THE FIRST GRADE[1]

I. Topic: *This little pig went to market.*

II. Teacher's aims.

(1) To have pupils read from blackboard, chart, and book, the Mother Goose rhyme, "This little pig went to market," which they already know by sound.

(2) To have them learn to recognize at sight the words and phrases listed below under 2 C.

III. Procedure and subject-matter.

Subject-Matter	*Procedure*
1	1
A. This pig went to market; This pig stayed at home; This pig had a bit of meat; This pig had none; This pig said, "Wee, wee, wee, I can't find my way home."	A. What Mother Goose rhyme did we read in the last lesson? Which one did Althea's mother tell her? (Althea recites "This pig," etc.) See if I put it on the board as Althea said it.
	B. (Pupils' aim.) To see if the rhyme on the board is like Althea's rhyme.
2	2
A. See A under 1 above.	A. Write first line in script. Have it read by pupil. Treat other lines similarly. Finally have entire rhyme read by individuals and by class as a whole.
B. See A under 1 above.	B. Present printed chart showing same rhyme. Pupils read rhyme from chart.

[1] Based upon a lesson given by Miss Clara James, formerly of the Speyer School, Teachers College, Columbia University.

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C. went, home, pig, market, find, meat, a bit, to market, at home, stayed, of meat, This pig, I can't, my.

D. Rhyme in book.

C. Teacher to show cards each containing a word or phrase. Pupils to find the same word on blackboard and chart.

D. Pupils read rhyme in book.

3

E. What did Althea's mother teach her? Is it like the rhyme in our book? Is it like the rhyme on the blackboard?

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LESSON PLAN IN COMPOSITION FOR THE SECOND GRADE[1]

I. Topic: *A recipe for lemonade.*

II. Teacher's aim: To have pupils prepare and copy a recipe for making lemonade.

III. Subject-matter and procedure.

Subject-Matter	*Procedure*
1	1
A. Use of a recipe.	A. Mr. W.'s class tried to make lemonade, but did not like it. They like our kind better. How can we let them know how we made ours? (Pupils' aim.) To write a recipe for Mr. W.'s class, telling how to make good lemonade.
2	2
A. To make lemonade for 18 people. Juice of 6 lemons. 18 teaspoons of sugar. 18 cups of water. Stir juice and sugar well, then add the water.	A. How many pupils in our class? We shall write the recipe for lemonade for 18 people. How many lemons used? How much sugar? And last of all? Mr. W.'s lemonade was not good because he did not stir it well. What shall we write to help him? Then what? (Explain *add* if necessary.) Each pupil to copy recipe for Mr. W.'s class.

[1] Based upon a lesson given by Miss Mott of the Ethical Culture School, New York City.

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LESSON PLAN IN COMPOSITION FOR THE THIRD GRADE[1]

I. Topic: *The School Assembly.*
II. Teacher's aim: To train the pupils in preparing an outline for a written composition on the school assembly.
III. Procedure, and arrangement of subject-matter.

Subject-Matter	*Procedure*
1	1
A. The assembly. Hymn. Plays. Indian letter, etc.	A. How many were absent from assembly, last Friday? Who were present? Did you enjoy it? What parts did you enjoy? How can you share your pleasure with those of the class who were not there? (Pupils' aim.) To write an account of the last assembly for those members of the class who were absent. What shall we need to think about in writing this account? (Pupils' second aim.) To determine the title and the topics for the composition.
2	2
A. Possible suggestions: — The third assembly. Our third assembly. Second and fourth grade. Assembly.	A. Suggest a good title. (Pupils and teacher inspect titles and select the best offered, with reasons for selection.)
B. (A possible outline. The pupils may vary from this. Their order will be accepted	B. What are the things we shall want to write about in our stories?

[1] Based upon a lesson conducted in the Demonstration School of the Columbia University Summer Session by Miss Roxana Steele.

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as given if it is good. If it is faulty, they will be helped to correct it.)
(1) Opening exercises.
(2) Announcements.
By Ruth Helter.
By three fifth-grade boys.
(3) Program.
Play by the second grade — *The Pot of Gold*.
Play by the fourth grade — *Peace Pipe*, from *Hiawatha*.
A real Indian letter.

3

C. The composition.

3

C. Pupils write their accounts. Teacher to give individual or class help as needed.

D. The compositions will occupy more than one lesson period. When completed, they are to be read aloud to class.

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LESSON PLAN IN NATURE STUDY FOR THE THIRD GRADE[1]

I. Topic: *The fish.*
II. The teacher's aims.
  (1) To prepare children for a trip to the aquarium.
  (2) To present the principle of adaptation to environment as illustrated in the case of the fish.
III. Subject-matter and procedure.

Subject-Matter	*Procedure*
1	1
A. Goldfish in aquarium in the classroom.	A. I have noticed how much you enjoy the goldfish which Miss W. has sent to visit us. Did you ever stop to think how it is that fish can live in water? Let us find as many answers as we can to the question. (Pupils' aim.) How is it possible for fish to live in water?
B. (1) Scales. Overlap and form covering. Protect from the water and from objects in water, etc. (2) Shape of fish. Like wedge or boat. Cuts through water. (3) Tail. Narrow where it joins body. Acts as a rudder. Helps in swimming. (4) Fins. Used for balance and swimming.	B. Choose some part of the fish and tell how it helps the fish to live in the water. (If children are slow in answering, name the parts first and record answers on the blackboard. Use blackboard drawings freely. Motions of the hand help to make clear the ideas of wedge-shaped, rudder, etc.)

[1] Adapted from a lesson plan prepared by Miss Roxana Steele, of the Horace Mann School, Teachers College, Columbia University.

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Those at top and bottom serve as centerboard; those at sides, as oars.

(5) Eyes.

No eyelids.

Horny covering for protection.

Eyes project. Can see in all directions.

(6) Gills.

Used to feed and breathe.

Water goes in mouth and out gills.

(7) Air bladder.

Used to raise and lower fish in the water.

C. Do you suppose there are still more answers that we have not thought of?

Where can we find the answers?

We are going to visit the aquarium where you will probably find many other answers. Then we shall have another lesson to hear what you have discovered.

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LESSON PLAN IN LANGUAGE FOR THE FOURTH GRADE[1]

I. Topic: *Three Golden Apples; Hercules and Atlas.*

II. The teacher's aims.
   (1) A knowledge of the portion of the story in which Hercules meets Atlas.
   (2) Through acquaintance with this story, to further the appreciation of good literature.
   (3) The development of a simple outline of the story.
   (4) Oral reproduction of the story for clear, definite statements and adequate expression of feeling.

III. Procedure, and psychological arrangement of the subject-matter.

Subject-Matter	*Procedure*
1	1
The journey in the golden bowl. (Review.)	Where did Hercules go after leaving Africa? How did he make this journey? What shall we find out next? (Pupils' aim.) What happened to Hercules after his journey in the golden bowl?
2	2
Hercules and Atlas. A. Meeting the giant. (1) His appearance. (2) The storm. B. Hercules' errand. (1) The giant's offer. (2) Hercules takes the burden. C. Atlas' journey. (1) Securing the apples. (2) His return. D. The giant's second offer. (1) Hercules' relief.	(The teacher tells the story, observing order of points, and by tone and manner making the story dramatic, bringing out dialogue clearly.)

[1] Prepared in the Practice School of the Rhode Island State Normal School.

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3

I. The need of an outline as shown by tendency to lose the place.
II. The outline as prepared by the pupils.

REFERENCES: Bulfinch, *The Age of Fable*. Gayley, *Classic Myths*. Hawthorne, *The Wonder-Book*.

3

What difficulty have we found in the story-telling?

What can we do that will help us?

(Conversation with the children to develop a plan for orderly arrangement of the new material. Children begin telling the story in sections.)

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SHORT LESSON PLAN IN GEOGRAPHY FOR THE FOURTH GRADE[1]

I. Teacher's aim: To teach names of continents and oceans.

II. Pupils' aim: To be able to tell from the map of the world how people from the different continents will reach the World's Fair in San Francisco in 1915.

III. Subject-matter and procedure.

Subject-Matter	*Procedure*
A. Stockholm, Atlantic Ocean, Panama Canal, Pacific Ocean.	A. Tell how a little Swedish girl can reach San Francisco.
B. (New situation involving teaching of directions on map.)	B. How can a little boy from China come? (Lesson to continue on this plan. May cover five or six periods.)

[1] Prepared by Mrs. M. A. Oliver in the Demonstration School of Teachers College, Columbia University.

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AN INDUCTIVE DEVELOPMENT LESSON IN ARITHMETIC[1]

I. Topic: *The multiplication of a decimal by a decimal.*

II. Teacher's aim: To lead children to the generalisation that the number of decimal places in the product equals the sum of those in the multiplicand and multiplier.

III. Subject-matter and procedure.

Subject-Matter	*Procedure*
1	1
A. Data based on Mass. Commission's *Cost of Living*, 1910. Breadstuffs cost 8.9 % of total amount (9 % used); sugar, $5\frac{1}{2}$ %; eggs, 3.7 % (4 % used); potatoes, 3 %.	A. What percent of the total amount spent for food is spent for breadstuffs? For sugar? Eggs? Potatoes?
B. $\$36$ $.09$ $\$3.24$	B. Show how we found the amount spent for breadstuffs when the total amount for the month is \$36.
	C. How shall we find the daily amount based on a daily expenditure of \$1.20? (Children try with the expected result that they will see the need for some guide.) (Pupils' aim.) To learn how to multiply one decimal by another.
2	2
A. (1) $.4 \times .2$ may also be written $\frac{4}{10} \times \frac{2}{10} =$	A. (1) Teacher places on board $.4 \times .2 =$? Pupils read it. Write as fractions. ($\frac{4}{10} \times \frac{2}{10} =$). What is the result of the multiplication? ($\frac{8}{100}$) Write the answer in decimal form. (.08)

[1] Adapted from a plan prepared by Miss Blanche E. Campbell, of the Speyer School, Teachers College.

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(2) $.4 \times .2 = .08$

(3)
$$\begin{array}{r} .4 \\ .2 \\ \hline .08 \end{array}$$

(4) $.3 \times .12$
$.04 \times .11$
$.5 \times .125$
$.11 \times .123$

(2) Complete the statement $.4 \times .2 =$

(3) Write it in the usual form of multiplying.

(4) Treat each one of these expressions as you did $.4 \times .2$ and write the answers.

3

A. (1) Rule for pointing off in multiplication of decimals. (See Teacher's aim.)

(2) Verification.
(See Thorndike's *Principles of Teaching*, p. 159. Smith's *Grammar School Arithmetic*, p. 107.)

3

A. (1) What relation do you see between the number of places in the product and those in the numbers which we multiplied together?
(It may be necessary to break this up into smaller questions.)

(2) *a.* By appeal to facts.
b. By appeal to authority.

4

A. (1) The amount spent for breadstuffs is 9% of entire expenditure for food. Find the cost of breadstuffs for one day when $1.20 is spent for food.
(2) Same for butter, 9 %.
(3) Same for milk, 8 %.
(4) Same for sugar, $5\frac{1}{2}$ %.
(5) Same for potatoes, 3 %.
(6) Same for eggs, 4 %.
(7) Same for meats, 48 %.
(8) How much of the $1.20 is left for all other items of food?

B. Restatement of rule for determining the number of decimal places in the product.

4

A. Home work.

B. How will you know how many decimal places to point off in the various products?

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LESSON PLAN IN GEOGRAPHY FOR THE SIXTH GRADE [1]

I. Topic: *Climate of the Western States.*

II. Teacher's aims.
   (1) To teach the facts about the variations of climate in the Western States.
   (2) To trace the causes of these climatic conditions.
   (3) To lead pupils to a keener appreciation of the close ties binding widely separated sections of the country.

III. Topical outline.
   Climate of the Western States.
   A. Climatic conditions in West as inferred from —
      (1) Animal and vegetable products.
      (2) Fame of many health resorts.
   B. Range of temperature in West —
      (1) According to districts.
      (2) According to seasons.
   C. Distribution of rainfall —
      (1) According to districts.
      (2) According to seasons.
   D. Causes of these conditions —
      (1) Latitude.
      (2) Elevation.
      (3) Winds.
      (4) Ocean currents.
   E. Effects upon products and people.

IV. Procedure, and psychological arrangement of subject-matter.

Subject-Matter	*Procedure*
1	1
A. (1) New England's dependence upon West for *a.* Raw materials for manufacturing. Metals — gold, silver, copper, mercury, etc. Animal products — wool, hides.	A. *a.* In yesterday's lesson, what materials did we find that New England obtains from the West for use in manufacturing?

[1] Adapted from a lesson plan prepared in the Practice School of the Rhode Island State Normal School.

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b. Food products — Fruits, fresh — oranges, lemons, figs, apricots, peaches, cherries, plums, apples. Fruits, dried — prunes, raisins, evaporated peaches, apricots, etc. Olives, olive oil, wine. Grain—wheat, corn, oats, barley, alfalfa. Meat — beef, pork, mutton.	*b.* What other products of the West are used by us here in New England? (Make list on board as illustrated, teacher supplementing, if necessary.)
c. Other products — ostriches, cacti.	*c.* (Same as *b* above. Show cactus, if possible.)
d. Varying degrees of fertility, heat, light, and moisture needed. Corn, more heat than wheat. Sheep, less moisture than cattle, etc. Subtropical and temperate.	*d.* Why do we not raise these products for ourselves? (Consider individual cases.) What conditions are necessary for their production? Are these conditions equally necessary for all products? Illustrate. Classify products to zones. We know that all these various products are grown in the West, although many of them cannot be raised in New England. To understand how this can be so, what must we learn about the Western States? (Pupils' aim.) Since these products are all found in the West and the requisites for growth are so different, what must be true of the climate in that section?
2	2
A. (1) Discovery of gold.	A. (1) What first caused migration from the East to the Far West?

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(2) Search for health.

a. Resorts visited.

Colorado, New Mexico, Arizona, and Southern California have many; e.g., Colorado Springs, Las Vegas, Hot Springs, Los Angeles, Pasadena, etc.

b. Climate favorable.

Dry, pure air, sunlight, equable temperature.

REFERENCES: (Pamphlets issued by railroads, Arizona Health Resorts, California, Colorado Outings, etc.)

(2) For what reasons have people more recently left the East to live in the West?

Name some of the most famous health resorts of the West.

From what disease are most of the health-seekers sufferers?

What climatic conditions are needed by consumptives?

What may we assume as to the existence of these conditions in the West?

Give information as to climatic conditions in Southwest to supplement inferences.

(Summarize information about climate gained from consideration of products and health resorts.)

B.	Winter	Summer
Rocky Mts.	20–30°	60–70°
Plateau	30–40°	70–80°
N.W Coast	40–50°	60–70°
S.W. Coast	Over 50°	60°
Montana	0–10°	60–70°

Range between seasons
in Montana 60°
in S.W. Coast 10°
in N.W. Coast 20°

B. What is the average winter temperature of the Rocky Mountain system? Of plateau region? Of northwest coast? Where coldest in winter? Warmest? (Other similar questions. Same procedure with summer temperature.)

(Refer to isothermal charts, Tarr and McMurry, part III, pp. 72, 73; Frye, p. 75. Give pupils practice in reading charts.)

What is the difference between the summer and winter temperatures on coast, plateaus, mountains? Where is the climate most equable? Most extreme?

(Summarize knowledge gained from charts.)

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C. (Refer to pupils' aims.)

D. (Pupils should ask questions about amount of rainfall, causes of varying conditions found, and the effects of the various kinds of climate upon productions, occupations, etc.)

REFERENCES: Carpenter's *North America*. Tarr and McMurry's *North America*. Frye's *Grammar School Geography*. Railroad pamphlets.

C. What question are we trying to answer? What have we learned about it thus far?

D. What other questions about the climate of the Western States should we answer?

E. Individual assignments of topics to various pupils.

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LESSON PLAN IN GEOGRAPHY FOR THE SIXTH GRADE[1]

I. Topic: *Irrigation in the Western States.*

II. Teacher's aims.
   (1) To teach the facts about irrigation in the West.
   (2) To arouse or increase the interest of the class in the development of the West and in its possibilities.
   (3) To further an appreciation of the difficulties with which the people in the rainless areas must contend.

III. Analysis of topic. Pupils must know: —
   (1) Main factors necessary to plant growth.
   (2) Effect of lack of sufficient moisture upon vegetation and indirectly upon density of population in the region affected.
   (3) That there are large areas of unproductive land in the United States, which if they could be made productive would meet the demand for farm lands and would contribute to the support of the increasing population of the United States, as well as of other parts of the world.
   (4) The location and extent of the unproductive regions, the reasons for their unproductiveness, and the possible sources of water supply.
   (5) The processes of irrigation; the reclamation service; results of irrigation upon crops and upon density of population in the regions where the process has been introduced.

IV. Procedure, and arrangement of subject-matter to be taught.

Subject-Matter	*Procedure*
1	1
A. Increased cost of fruit and vegetables in summer and fall of dry season. Cause — small crops due to drought.	A. How many of you know how the prices of fruits and vegetables during the summer and fall of this year compare with preceding year's prices? (Conversation with those who know so as to bring out the greatly increased prices in some years.) What causes the high prices usually?

[1] Prepared by the author for the *Syllabus of a Course on the Theory and Practice of Teaching in Elementary Schools*, published by Teachers College, Columbia University.

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B. Fertile soil, heat, light, and moisture necessary to plant growth.	B. In order that plants in the garden or crops in the fields may grow well, what conditions are necessary?
C. Lack of moisture causes partial or total failure of crops. In dry regions there is little vegetation and consequently but few people live in such places.	C. In this region, which of these factors is sometimes lacking? Refer to drought of summer of 1907. What is the effect upon vegetation when but little rain falls during the entire summer? When year after year there is little or no rainfall? How about the density of population in such a country even when temperature and soil are favorable to plant growth?
D. Almost continuous drought with consequent dearth of vegetation and scanty population the condition in a large part of the Western States (the Plateau States and the Pacific States). One fifth of total area of United States is arid. (For tables showing population, see Tarr and McMurry, *Geography*, Second Book, pp. 424–30, or Dodge, *Adv. Geog.*, p. 7 of Appendix.)	D. In previous lessons we have learned that there are extensive arid regions in our own country. In what part of the country are they located? Name the States included. Compare the population of the Plateau States with that of any other equal number of States or with that of each of the three largest cities in the United States.
E. The arid region is very large. (Maps, and tables of areas.) The population of the United States is increasing. There is a demand for farm lands. There is a great demand from foreign countries for foodstuffs.	E. Is it of significance to the country as a whole that these regions remain unproductive?
	F. What problems grow out of the situation ? (Pupils' aims.) *a*. Can these arid regions be made productive? If so, how? *b*. What will be the effects

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produced in case these large tracts of land can be brought under cultivation?

2	2
A. Means for overcoming effects of drought. *a.* In limited areas — sprinkling, watering by hand. *b.* In extensive areas — irrigation. (Tarr and McMurry, *Geog.*, Second Book, p. 286. Dodge, *Adv. Geog.*, p. 166. King, *Adv. Geog.*, pp. 141–46.)	A. When the lawns or gardens in our part of the country grow too dry, how are they kept growing? What means must be employed to provide water in very large areas? Are these means used in the Plateau and Pacific States? (Class consult the references named.)
B. Sources of water supply. *a.* Rivers. *b.* Mountain streams fed by rain, snow, or glaciers. *c.* Artesian wells. *d.* Lakes. (T. and M. *Geog.*, Sec. Book, p. 297. Dodge's *Adv. Geog.*, p. 172. King's *Adv. Geog.*, p. 142. *Review of Reviews*, XXXI, 701–04.)	B. Where can the water be obtained for irrigating purposes in these dry areas? (Conversation. Assignment to books in use by all of the class. Assign article in *Review of Reviews*, XXXI, 701–04, to a pupil as a special topic.)
C. The process of irrigation. *a.* Water storage, reservoirs, dams. *b.* Ditches or canals. *c.* Surface irrigation. *d.* Sub-irrigation. (See geographies quoted under B above.) *Pop. Sci. Mo.*, LXVII, 684, 686.	C. How can the supply of water which falls during the rainy season be kept for use during the dry season? (Assignment of special topics relating to particular subjects.) How is the water in the reservoirs of rivers distributed to the fields when it is needed? (Illustrate by an outdoor lesson; or if the nature of the country is not suited to illustrate the process, use the sand table and construct a system of irrigation showing reservoir, main canals, and the distributing ditches. Assign sub-irrigation as a special topic.)

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D. The reclamation service.
   a. The nature of its work.
   b. The territory affected.
   (See *The World's Work*, December, 1907.)

D. How does the United States Government aid in reclaiming the waste lands of the West?

E. How the Government gets its money back.
   a. Sale of land in tracts not exceeding 160 acres to an individual.
   b. Payment in ten equal annual installments.
   (*The Cosmopolitan*, XXXVII, 715–22. *The World's Work*, December, 1907.)

E. What disposition does the Government make of the reclaimed lands?

F. The effects of irrigation.
   a. Upon agriculture.
   (See geographies quoted above; also *The Cosmopolitan*, XXXVII, 718–22. *The World's Work*, December, 1907.)
   b. Upon secondary industries.
   c. Upon population in the areas irrigated.
   (King's *Adv. Geog.*, pp. 152–54; also other geographies quoted above. *The World's Work*, December, 1907.)

F. Would it pay a man to buy a forty-acre tract in the irrigated region? What crops could he produce? Value of crops? (Estimated.) Where there are prosperous farming communities, what other industries are possible? Are they found in the irrigated districts? With agriculture, fruit growing, and other industries made possible and profitable, what effect is produced upon immigration to the Western States?

What problems did we set out to solve in these lessons on irrigation? What is the answer to each?

3

(See II above.)

3

A. Topic for class as a whole.
   a. Value of forests to systems of irrigation.
   b. Our relations to the irrigated regions.
   c. Advisability of introducing irrigation in the Eastern States.
   d. Irrigation in Egypt.
   e. Irrigation in India.

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B. Individual assignments.

a. Economy of water in irrigating.

b. Fruit growing on irrigated land.

c. Advantages and disadvantages of farming in the East and in the West.

d. Relative value to a State of gold mining and farming.

e. Relation of irrigation in the West to the people of Europe.

f. To the people in the Eastern States.

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FIRST LESSON OF A SERIES IN ORAL READING[1]

I. **Teacher's aims.**
   (1) To set up a real reason in the child's mind for reading aloud.
   (2) To evolve in simple terms the standards of good reading so that the child may have definite ends to attain in his studying.

II. **Pupils' aim:**
   To evolve a method of choosing the four best readers in the class.

III. **Situation:**
   The teacher has been reading a number of stories to the children in which the interest has been entirely in the story. Any instruction in reading, as such, has been taken in unconsciously by the child.

IV. **Subject-matter and procedure.**

Subject-Matter	*Procedure*
Introduction.	"I have been reading to you for quite a long time. It is not fair for me to do all the reading, for every one of you will at some time or other have to read aloud to some one else, so I am going to ask you to read our next story — Dickens's *The Cricket on the Hearth*. Inasmuch as we have but five copies available, it will be necessary to choose five pupils each day who will be responsible for reading the next day. "While you are reading I want to carry on an experiment. I am going to try to determine who are the four best readers in the class. I want you to do the same, and when we have finished we 'll compare and see how nearly we agree."
The need for bases of choice.	"Grace, how will you make your choice?" "Charles, would you follow the same method?"

[1] Prepared and taught by Edwin A. Lee of the Speyer School.

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(From the answers gained from these and other children it is possible that the next step will follow logically.)

"It really resolves itself into this question, does n't it, — What are the marks of a good reader?

"If we can arrive at a set of standards of good reading, we shall have a real basis for choosing."

Standards of Reading.
1. Ability to express thought author intended.
2. Enunciation.
3. Inflection and expression.
4. Quality of voice.
5. Poise.
Name of marker.

"Harry, what is one mark of a good reader?"

From this point the lesson depends on what one gets from the children. They will, without doubt, give numbers one and two. Number three can be gained by reading to them in a monotone, and asking them why they dislike it. Number four they will give if the teacher reads in an unpleasant tone.

Poise is probably the most difficult mark to get because that phase has not been brought to their conscious attention. Each child will, however, have an appreciation of its importance once he understands its meaning.

How to use these standards.

Here again the procedure depends on the children. The thing is not to get definite marks but the *desire* to mark. Therefore the marking may be on a basis of 1—2—3—4—5, or A—B—C—D—E, or Excellent—Good—Fair—Unsatisfactory — Poor. If the child knows that his comrades are going to mark him Excellent or Poor on each of the five standards, the chances are that he will strive to make the mark high.

Note: The lesson following might very well be one on how to study the reading lesson in the light of the standards set up.

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PLANS FOR LESSON ASSIGNMENTS[1]

I. Subject: *Washington's Administration.*
II. Topics to be studied: Methods of raising money to carry on the new government; how they worked; how they were received by the people; the Whiskey Rebellion.
III. Preparation: What decision had Congress reached as to whether all the debts should be paid or not? Did the Government have any money then? What does it need money for? How does it raise money to-day? Do you suppose Congress tried any of these ways in 1789? To-morrow we shall find out
(1) What the tariff is.
(2) What an excise tax is.
(3) To what extent these means of raising money were employed.
(4) How the people liked these plans.
(5) Whether any serious difficulty was met in enforcing them.

I. Subject: *Washington's Administration.*
II. Topics to be studied: The National Bank; the mint; the system of coinage.
III. Preparation: How do you suppose Congress was to collect the revenue? What kind of money did the people have at that time? What were the difficulties with such a system? Do you know how they were overcome?

For to-morrow, then, look up the answers to these questions or think them out for yourselves: —
(1) What did Hamilton propose as a means to collect the revenue?
(2) What were the arguments for and against his plan? Which side would you take?
(3) What plan was finally adopted?
(4) How did we come to have our present system of money?

I. Subject: *The War of 1812.*
II. Purpose: A summing up of the lessons on the War of 1812, with especial emphasis on its justifiableness as considered from its treaty results.
III. Preparation: When did the Hartford Convention meet? How were the difficulties arising from it stopped? Do you know

[1] These assignment plans belong to a series prepared by Miss Lila E. Benton, of the State Normal School, Greeley, Colorado. A few modifications have been made because they have been taken from their setting and presented separately.

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what we gained by this treaty of peace? What did we want to gain? What ought we to find out about this treaty?
Questions for study: —
(1) What were the provisions of the treaty?
(2) What did we gain by the War of 1812?
(3) From the results, do you think the war was justifiable? Think out as many arguments for each side as you can.

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OUTLINE

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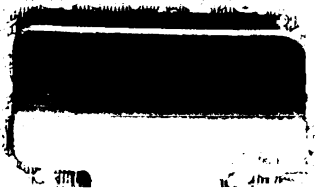

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